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OPHTHALMOLOGICAL TRANSACTIONS.

VOL. VIII.

TRANSACTIONS

OF THE

OPHTHALMOLOGICAL SOCIETY

OF THE

UNITED KINGDOM.

VOL. VIII.

SESSION 1887-88.

WITH

LIST OF OFFICERS, MEMBERS, ETC.

LONDON
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NOTICE.

The present volume comprises the proceedings of the Ophthalmological Society of the United Kingdom, during its eighth Session, October, 1887, to July, 1888.

The Society does not hold itself responsible for the statements, reasonings, or opinions expressed in the communications which the Council has deemed suitable for publication.

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OF THE

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1883 JONATHAN HUTCHINSON, F.R.S.

1886 JOHN WHITAKER HULKE, F.R.S.

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O.M.—Original Member.
Pres.—President.
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L.—Librarian.
S.—Secretary.
C.—Member of Council.
*.—Denotes Resident Life Members.
†.—Denotes Non-Resident Life Members.

GENERAL LIST OF MEMBERS.

ELECTED

O.M. *Abercrombie, John, M.D., Assistant Physician to the Charing Cross Hospital, and to the Hospital for Sick Children, Great Ormond Street; 23, Upper Wimpole Street, W. (S. 1882-5. C. 1885-8.)

O.M. *Adams, James E., care of F. Gordon Brown, Esq., 17, Finsbury Circus, E.C. (C. 1880-3.)

O.M. Adams, M. A., Surgeon to the Kent County Ophthalmic Hospital, Ashford Road, Maidstone.

ELECTED

1884 †Allison, H., M.D., care of Messrs. Binny and Co., Madras, India.

1884 Anderson, James, M.D. (S.), Assistant Physician to the London Hospital and to the National Hospital for the Paralysed and Epileptic; 84, Wimpole Street, W.

1887 *Anderson, Tempest, M.D., Ophthalmic Surgeon to the York County Hospital; 17, Stone-gate, York.

1883 Andrews, A. G., 1, Clifford's Inn, Temple Bar, W.C.

O.M. Appleyard, John, M.B., Surgeon to the Bradford Infirmary; 1, Clifton Villas, Manningham, Bradford, Yorkshire.

O.M. Archer, T. Brittin, Senior Surgeon to the Central London and Western Ophthalmic Hospitals; 64, South Molton Street, Brook Street, W.

O.M. Bankart, James, M.B., Surgeon to the Devon and Exeter Hospital, and to the West of England Eye Infirmary; 19, Southernhay, Exeter.

O.M. Barlow, Thomas, M.D., Physician to, and Assistant Professor of Clinical Medicine at, University College Hospital; Physician to the Hospital for Sick Children, Great Ormond Street; 10, Wimpole Street, W. (C. 1880-81.)

1883 Barton, J. Kingston, 2, Courtfield Road, Gloucester Road, S.W.

O.M. Beevor, C. E., M.B., Physician to the National Hospital for the Paralysed and Epileptic and to the Great Northern Central Hospital; 33, Harley Street, W.

O.M. Benson, A. H., M.D. (C.), Assistant Surgeon to St. Mark's Ophthalmic Hospital, Ophthalmic Surgeon to the City of Dublin Hospital, and Examiner in Ophthalmic Surgery to the Royal College of Surgeons of Ireland; 42, Fitzwilliam Square, Dublin.

O.M. Berry, G. A., M.D., Ophthalmic Surgeon, Royal Infirmary, and Lecturer on Ophthalmology Royal College of Surgeons, Edinburgh; 23, Rutland Street, Edinburgh.

ELECTED

1881 Bickerton, T. H., Oculist to the Liverpool Royal Infirmary ; 86, Rodney Street, Liverpool.

1885 Blumer, W. P., Honorary Surgeon to the Sunderland and North Durham Eye Infirmary; Burn House, Durham Road, Sunderland.

O.M. Boon, Alfred, St. Kitts, West Indies.

O.M. Bowman, Sir W., Bart., LL.D., F.R.S., Consulting Surgeon to the Royal London Ophthalmic Hospital, Moorfields; 5, Clifford Street, Bond Street, W. (*Pres.* 1880-3. V.-P. 1884-6.)

1885 Bower, Ernest Dykes, Ophthalmic Surgeon to the Gloucester General Infirmary ; 1, Norfolk Terrace, Gloucester.

O.M. Brailey, W. A., M.D. (C.), Ophthalmic Assistant Surgeon to Guy's Hospital; Ophthalmic Surgeon to the Evelina Hospital for Children ; 11, Old Burlington Street, W. (S. 1883-6. C. 1880-3).

O.M. Broadbent, W. H., M.D., Physician to, and Lecturer on Medicine at, St. Mary's Hospital; 34, Seymour Street, Portman Square, W. (V.-P. 1882-3.)

1881 †Brockman, E. F., Professor of Physiology and Diseases of the Eye at the Medical College, Madras ; Eye Infirmary, Madras.

1886 Bronner, Adolf, M.D., Surgeon to the Bradford Eye and Ear Hospital; 33, Manor Row, Bradford.

1882 Brown, George A., Tredegar, Monmouthshire.

O.M. Browne, Edgar A. (C.), Senior Surgeon to the Liverpool Eye and Ear Infirmary ; 39, Rodney Street, Liverpool.

1885 Browne, Oswald A., 6a, Bedford Square, W.C.

O.M. Bubb, J., Surgeon to the Cheltenham and Gloucester Ophthalmic Infirmary ; 6, Royal Crescent, Cheltenham.

1883 †Buller, Frank, M.D., 838, Dorchester Street, Montreal, Canada.

O.M. †Burnham, G. H., M.B., 157, Simcoe Street, Toronto, Canada.

ELECTED

O.M. Buzzard, Thomas, M.D. (V.P.), Physician to the National Hospital for the Paralysed and Epileptic ; 56, Grosvenor Street, W. (C. 1881-2.)

1887 Cant, W. E., M.D., British Ophthalmic Hospital, Jerusalem, Palestine.

1882 Cant, W. J., 3, Lindum Road, Lincoln.

O.M. Carter, R. Brudenell, Ophthalmic Surgeon to, and Lecturer on Ophthalmic Surgery at, St. George's Hospital, Ophthalmic Surgeon to the National Hospital for the Paralysed and Epileptic; 27, Queen Anne Street, W. (C. 1880-3.)

O.M. Charnley, William, M.D., Surgeon to the Shropshire Eye, Ear and Throat Hospital ; Stone House, Shrewsbury.

1885 Chesshire, Arthur Edwin, 2, St. Mark's Place, Wolverhampton.

O.M. Chesshire, Edwin, Senior Surgeon, Birmingham and Midland Eye Hospital; 58, Newhall Street, Birmingham.

1885 Clarke, Ernest, M.D., Surgeon to the Miller Hospital, and Senior Assistant Surgeon to the Central London Ophthalmic Hospital ; 21, Lee Terrace, Blackheath, S.E.

1885 Collins, E. Treacher, Curator and Librarian to the Royal London Ophthalmic Hospital, Moorfields; 6, West Street, Finsbury Circus, E.C.

1886 Collins, W. J., M.D., 1, Albert Terrace, Regent's Park, N.W.

1884 Coulter, William, M.D., Calcutta.

O.M. Couper, John, Senior Surgeon to the London Hospital, and Surgeon to the Royal London Ophthalmic Hospital, Moorfields ; 80, Grosvenor Street, W. (C. 1881-2.)

O.M. Coupland, Sidney, M.D., Physician to, and Lecturer on Practice of Medicine at, the Middlesex Hospital; 14, Weymouth Street, Portland Place, W. (C. 1885-8.)

ELECTED

O.M. Cowell, George, Senior Surgeon, Lecturer on Surgery and Ophthalmic Surgeon to the Westminster Hospital; Surgeon to the Royal Westminster Ophthalmic Hospital; 3, Cavendish Place, Cavendish Square, W. (C. 1883-6.)

O.M. Critchett, G. Anderson, Ophthalmic Surgeon to, and Lecturer on Ophthalmic Surgery at, St. Mary's Hospital; 21, Harley Street, W. (C. 1883-6.)

1881 Cross, F. R., Ophthalmic Surgeon to the Bristol Royal Infirmary; Surgeon to the Bristol Eye Infirmary; Ophthalmic Surgeon to the Bristol Dispensary; Chandos Villa, Clifton, Bristol.

O.M. Davidson, A. Deas, M.D., Ophthalmic Surgeon to Swansea Eye Hospital; 5, Picton Place, Swansea.

1884 Davidson, James McKenzie, M.B., Ophthalmic Surgeon to the Royal Infirmary, and Surgeon to the Eye Institution, Aberdeen; 2, Bon Accord Square, Aberdeen.

O.M. Dent, Clinton Thomas, Assistant Surgeon to St. George's Hospital; 61, Brook Street, W.

1883 Dew, Henry, Surgeon to the Bristol Eye Hospital; Berkeley Square, Bristol.

1881 Dixon, W. E., 164, Westbourne Terrace, Hyde Park, W.

1882 †Dodge, Stephen, M.D., Halifax, Nova Scotia.

1887 Doyne, Robert W., Surgeon to the Oxford Eye Hospital, and to St. John's Hospital, Cowley; 121, Woodstock Road, Oxford.

O.M. Duncanson, J. J. Kirk, M.D., Senior Surgeon to the Eye Infirmary, and to the Eye, Ear, and Throat Hospital, Edinburgh; 22, Drumsheugh Gardens, Edinburgh.

1886 Dunn, Hugh Percy, Assistant Ophthalmic Surgeon to the West London Hospital; 11, Nottingham Place, W.

O.M. Eales, Henry, Surgeon to the Birmingham and Midland Eye Hospital; 7, Newhall Street, Birmingham.

ELECTED

O.M. *Edmunds, Walter, M.D., Medical Officer, St. Thomas's Home; 79, Lambeth Palace Road, Albert-Embankment, S.E. (C. 1885-8.)

1883 Emrys-Jones, A., M.D., Surgeon to the Royal Eye Hospital; 10, St. John Street, Manchester.

1887 Ensor, Henry C., Ophthalmic and Aural Surgeon to the Cardiff Eye and Ear Hospital; 5, Charles Street, Cardiff.

1881 Farrant, Samuel, Surgeon to the Taunton and Somerset Hospital, and to the Taunton Eye Infirmary; North Street House, Taunton.

1888 Fergus, A. Freeland, M.B., Ophthalmic Surgeon to the Royal Infirmary, Glasgow, and Assistant Surgeon to the Glasgow Eye Infirmary; 191, Bath Street, Glasgow.

1888 Ferguson, Alex. F., M.B.

O.M. †Ferguson, H. L., Ophthalmic Surgeon to the Dunedin Hospital; Lecturer on Ophthalmology, Otago University; Dunedin, New Zealand.

O.M. Fitzgerald, C. E., M.D., Ophthalmic Surgeon to the Richmond Hospital; Lecturer on Ophthalmic Surgery Carmichael School of Medicine; 27, Upper Merrion Street, Dublin. (V.P. 1882-5. C. 1880-1.)

O.M. Fitz-Gerald, W. A., M.D., Highland View, Frimley, Farnboro, Hants.

1886 Ford, A. Vernon, Surgeon to the Portsmouth and South Hants Eye and Ear Infirmary; 14, High Street, Portsmouth.

O.M. Frost, W. Adams (L.), Assistant Ophthalmic Surgeon to St. George's Hospital; Surgeon to the Royal Westminster Ophthalmic Hospital; 17, Queen Anne Street, Cavendish Square, W.

1883 †Da Gama, Jerminio Accacio, Khoja Moola, Bombay.

1887 †Gardner, John J., M.D., 56, Beaver Hall, Montreal, Canada.

1885 Gay, William, M.D., 111, Disraeli Road, Putney, S.W.

1883 Gibbons, R. A., M.D., Physician to the Grosvenor Hospital for Women and Children; 29, Cadogan Place, S.W.

ELECTED

O.M. Glascott, C. E., M.D., Surgeon to the Manchester Royal Eye Hospital; 23, St. John Street, Manchester.

1885 †Godfray, Alfred Charles, St. Helier's House, St. Helier's, Jersey.

O.M. Gowers, W. R., M.D., Professor of Clinical Medicine at, and Physician to, University College Hospital; Physician to the National Hospital for the Paralysed and Epileptic; 50, Queen Anne Street, W. (C. 1880-3.)

1887 Green, Edwin Collier, 27, Friar Gate, Derby.

O.M. Greenfield, W. S., M.D., Professor of Pathology University of Edinburgh; Heriot Row, Edinburgh.

1885 Griffith, A. H., M.D., Assistant Surgeon, Royal Eye Hospital; 17, St. John Street, Manchester.

O.M. Grossman, K. A., Ophthalmic Surgeon Stanley Hospital, Liverpool; 70, Rodney Street, Liverpool.

1881 Gulliver, George, M.B., Assistant Physician to St. Thomas's Hospital, and to the London Fever Hospital; 16, Welbeck Street, W.

O.M. Gunn, R. Marcus (S.), Assistant Surgeon to the Royal London Ophthalmic Hospital, Moorfields, Ophthalmic Surgeon to the National Hospital for the Paralysed and Epileptic and to the Hospital for Sick Children, Great Ormond Street; 54, Queen Anne Street, W. (C. 1882-5.)

1887 Habershon, Samuel Herbert, M.D., Assistant Physician to the Royal Hospital for Diseases of the Chest; 2, Upper Wimpole Street, W.

1885 †Haines, Humphrey, Auckland, New Zealand.

1887 †Hamilton, T. K., M.D., Laura, South Australia.

1886 Hartley, Robert N., M.B., 38, Cookridge Street, Leeds.

1882 *Hartridge, Gustavus, Consulting Ophthalmic Surgeon to St. Bartholomew's Hospital, Chatham, and Surgeon to the Royal Westminster Ophthalmic Hospital; 65, Green Street, Grosvenor Square, W.

1882 †Henderson, W. H., M.D., Kingston, Ontario, Canada.

ELECTED

1887 Hern, John, M.D., Ophthalmic Surgeon and Surgeon to the Darlington Hospital; 13, Paradise Terrace, Darlington.

1883 Hewetson, H. B., Ophthalmic and Aural Surgeon, Leeds General Infirmary; 11, Hanover Square, Leeds.

O.M. Higgens, Charles, Ophthalmic Surgeon to, and Lecturer on Ophthalmology at, Guy's Hospital; 38, Brook Street, W. (C. 1880-3.)

1886 †Hodge, Rev. Sydney Rupert, M.R.C.S., Wesleyan Mission House, Hankow, China.

O.M. Hodges, Frank H., Ophthalmic Surgeon to the Leicester Infirmary; 17, Horse Fair Street, Leicester.

1885 †Howard, R. J. B., M.D., 47, Union Avenue, Montreal, Canada.

1884 †Hudson, Ernest (care of Messrs. King, King & Co., Jamsund Lane, Bombay).

O.M. Hulke, J. W., F.R.S. (*Pres.*), Surgeon to, and Lecturer on Surgery at, the Middlesex Hospital; Surgeon to the Royal London Ophthalmic Hospital, Moorfields; 10, Old Burlington Street, W. (V.-P. 1881-2. C. 1880-1.)

O.M. Hutchinson, Jonathan, F.R.S. (V.-P.), Consulting Surgeon to the London Hospital, and to the Royal London Ophthalmic Hospital; 15, Cavendish Square, W. (P. 1883-6. V.-P. 1880-1.)

1887 Hutchinson, Jonathan, jun., Ophthalmic Surgeon to the Great Northern Central Hospital; 15, Cavendish Square, W.

1883 †Jackson, James, M.D., Collins Street East, Melbourne, Australia.

O.M. Jackson, J. Hughlings, M.D., F.R.S., Physician to the London Hospital, and to the National Hospital for the Paralysed and Epileptic; 3, Manchester Square, W. (V.-P. 1880-2.)

1885 James, David P.

1888 James, J. T., 30, Harley Street, W.

ELECTED

O.M. Jeaffreson, C. S., Surgeon to the Newcastle-on-Tyne Eye Infirmary; 1, Savile Row, and 2, Fernwood Road, Newcastle-on-Tyne.

1883 †Jenkins, E. J., M.D., Nepean Towers, Douglass Park, Sydney, N.S.W., Australia.

1883 Jessop, W. H. H., Senior Assistant Surgeon to the Central London Ophthalmic Hospital; Ophthalmic Surgeon to the Paddington Green Children's Hospital; 73, Harley Street, W.

1881 Johnson, George, M.D., F.R.S., Physician to King's College Hospital; Professor of Clinical Medicine at King's College; 11, Savile Row, W. (C. 1883-5. V.-P. 1885-8.)

1882 Johnson, G. L., M.B., Cortina, Netherhall Terrace, South Hampstead.

O.M. Jones, Evan, Ty-mawr, Aberdare, Glamorganshire.

O.M. Jones, H. Macnaughton, M.D., 141, Harley Street, W.

O.M. Juler, H. E. (C.), Assistant Ophthalmic Surgeon to St. Mary's Hospital; Senior Assistant Surgeon, Royal Westminster Ophthalmic Hospital; 77, Wimpole Street, W.

1882 Keall, W. P., Surgeon to the Bristol General Hospital, and to the Eye Department; Lecturer on Operative Surgery at the Bristol Medical School; Nelson Lodge, Bristol.

1888 †Kenny, Augustus Leo, M.B., 52, Franklin Street, West Melbourne, Victoria, Australia.

1881 †Knaggs, S. T., M.D., 16, College Street, Hyde ,Park Sydney, New South Wales.

O.M. Lang, William (C.), Ophthalmic Surgeon to the Middlesex Hospital; Assistant Surgeon to the Royal London Ophthalmic Hospital, Moorfields; 26, Upper Wimpole Street, W.

1881 Langdon, J. Winkley, Ophthalmic Surgeon to Preston and County of Lancaster Royal Infirmary; Winkley Square, Preston.

ELECTED

O.M. Lawford, J. B. (C.), Assistant Ophthalmic Surgeon to St. Thomas's Hospital; 55, Queen Anne Street, W.

O.M. Lawson, George, Surgeon to the Royal London Ophthalmic and to the Middlesex Hospitals; 12, Harley Street, Cavendish Square, W. (C. 1882-4.)

1885 †Le Cronier, Hardwick, St. Helier's, Jersey.

O.M. Lediard, H. A., M.D., Surgeon to the Cumberland Infirmary; 43, Lowther Street, Carlisle.

1885 Lee, Charles E., Assistant Surgeon, Eye and Ear Infirmary, Liverpool; 73, Rodney Street, Liverpool.

O.M. Liddon, W., Surgeon to the Taunton and Somerset Hospital, Taunton.

O.M. Little, David, M.D. (V.P.), Surgeon to the Royal Eye Hospital, Manchester; Ophthalmic Surgeon, Royal Infirmary; Lecturer on Ophthalmology, Owens College, Manchester; 21, St. John Street, Manchester. (C. 1880-1.)

1883 Lunn, J. R., Resident Medical Officer, Marylebone Infirmary, Notting Hill, W.

1884 MacGregor, Alexander, M.D., Assistant Physician to the Aberdeen Hospital for Children; 256, Union Street, Aberdeen.

O.M. Mackenzie, F. M., 29, Hans Place, S.W.

1888 Mackay, George, M.B., 2, Randolph Place, Edinburgh.

O.M. Mackenzie, Stephen, M.D., Physician to, and Lecturer on Medicine at, the London Hospital; Physician to the Royal London Ophthalmic Hospital, Moorfields; 26, Finsbury Square, E.C. (S. 1880-2. C. 1882-5.)

O.M. Mackinlay, J. G. (C.), Ophthalmic Surgeon to the Royal Free Hospital, and Surgeon to the South London Ophthalmic Hospital; 15, Stratford Place, W.

O.M. Macnamara, Charles, Surgeon to the Westminster Hospital, and to the Royal Westminster Ophthalmic Hospital; 13, Grosvenor Street, W. (C. 1882-5.)

1881 †Maconachie, G. A., M.D., Grant Medical College, Bombay.

ELECTED

1883 †Maher, W. O., M.D., Surgeon to St. Vincent's Hospital; Ophthalmic Surgeon to the Sydney Hospital; Ophthalmic Surgeon to the Government Asylums at Parramatta and Liverpool; 20, College Street, Hyde Park, Sydney, N.S.W.

1883 †Marlow, Frank William, 13E, Jefferson Street, Syracuse, New York State, U.S.A.

O.M. Mason, Frederick, Surgeon to the Bath Eye Infirmary; 20, Belmont, Bath. (V.-P. 1881-4.)

1888 Martin, Albert, M.D., Wellington, New Zealand.

1884 Maxwell, Patrick William, M.B., 19, Lower Baggot Street, Dublin.

O.M. McHardy, M. M. (C.), Ophthalmic Surgeon to King's College Hospital; Professor of Ophthalmology, King's College; Surgeon Royal South London Ophthalmic Hospital; Ophthalmic Surgeon to St. John's Hospital; 5, Savile Row, W.

1884 McKeown, David, M.D., 25, St. John Street, Manchester.

1884 McKeown, W. A., M.D., 20, College Square East, Belfast.

O.M. Meighan, T. S., M.D., Surgeon to the Glasgow Eye Infirmary; 8, Monteith Row, Glasgow.

1881 †Milles, W. Jennings, care of Drs. Henderson and Macleod, Shanghai, China.

1883 Money, Angel, M.D., Assistant Physician to University College Hospital, and to the Hospital for Sick Children, Great Ormond Street; 24, Harley Street, W.

1887 Morgan, William Lewis, Surgeon to the Radcliffe Infirmary, Oxford; 42, Broad Street, Oxford.

O.M. Morton, A. Stanford, Surgeon to the Royal South London Ophthalmic Hospital; Ophthalmic Surgeon to St. John's Hospital; 26, Weymouth Street, W.

O.M. Mules, P. H., M.D. (C.), Surgeon to the Royal Eye Hospital, Manchester; 20, St. John Street, Manchester.

O.M. Nelson, Joseph, 2, Glengal Place, Belfast.

ELECTED

O.M. *Nettleship, Edward (V.-P.), Ophthalmic Surgeon to, and Lecturer on Ophthalmic Surgery at, St. Thomas's Hospital; Surgeon to the Royal London Ophthalmic Hospital, Moorfields; 5, Wimpole Street, W. (S. 1880-3. C. 1883-6.)

1881 Nicholson, A., Honorary Surgeon to the Sussex and Brighton Infirmary for Diseases of the Eye; 98, Montpellier Road, Brighton.

1887 Nunn, Richard, M.B.

1884 Oldham, Charles J., 1, Brunswick Place, Brighton.

O.M. Ord, W. M., M.D. (T.), Physician to, and Lecturer on Medicine at, St. Thomas's Hospital; 37, Upper Brook Street, W.

1881 Ormerod, J. A., M.D., Assistant Physician to the National Hospital for the Paralysed and Epileptic; 25, Upper Wimpole Street, W.

O.M. Owen, D. C. Lloyd, Surgeon to the Birmingham and Midland Eye Hospital; 51, Newhall Street, Birmingham.

O.M. Page, Herbert W., Surgeon to St. Mary's Hospital; 146, Harley Street, W.

1887 †Patell, D. H., 12, Ragoonatti Dadagi Street, Fort, Bombay.

O.M. Penfold, Henry, Consulting Surgeon to the Sussex Eye Hospital; 7, Brunswick Place, Brighton.

1888 Percival, Archibald Stanley, Royal Westminster Ophthalmic Hospital.

O.M. Power, Henry, Senior Ophthalmic Surgeon to, and Lecturer on Ophthalmic Surgery at, St. Bartholomew's Hospital; Surgeon to the Westminster Ophthalmic Hospital; 37A, Great Cumberland Place, W. (V.-P. 1882-5. C. 1880-2.)

1888 Price, John A. P., M.D., 41, Castle Street, Reading.

1882 Prichard Arthur William, Surgeon to the Bristol Royal Infirmary, to the Bristol Eye Dispensary, and to the Bristol Asylum for the Blind; Richmond Villa, Clifton.

ELECTED

O.M. Prichard, Augustin, Consulting Surgeon to the Bristol Royal Infirmary and Eye Dispensary ; 4, Chesterfield Place, Clifton. (V.-P. 1881-4.)

1882 Pringle, J. J., M.B., Assistant Physician to the Middlesex Hospital, and Physician to the Royal Hospital for Diseases of the Chest, City Road; 35, Bruton Street, W.

O.M. Purves, W. Laidlaw, Aural Surgeon to Guy's Hospital; Ophthalmic and Aural Surgeon to the Hospital for Paralysis and Epilepsy ; 20, Stratford Place, Oxford Street, W.

O.M. Pye-Smith, R. J., Surgeon to the Sheffield Public Hospital and Dispensary, 350, Glossop Road, Sheffield.

1888 Rainy, Adam R., M.B., 27, Green Street, W.

O.M. Redmond, D. D., Ophthalmic Surgeon to St. Vincent's Hospital, Dublin; 14, Harcourt Street, Dublin.

1881 †Reeve, R. A., M.D., Surgeon to the Toronto General Hospital, and to the Mercer Eye and Ear Infirmary; 22, Shuter Street, Toronto, Canada.

O.M. Reid, Thomas, M.D., Surgeon to the Glasgow Eye Infirmary, and Lecturer on Ophthalmic Medicine, University of Glasgow; 11, Elmbank Street, Glasgow. (V.-P. 1884-7.)

1885 Renton, James Crawford, M.D., 2, Buckingham Terrace, Glasgow.

1885 Roberts, Edward, Royal Eye Hospital, Manchester.

O.M. Robertson, D. Argyll, M.D. (V.-P.), Ophthalmic Surgeon to the Edinburgh Royal Infirmary; 18, Charlotte Square, Edinburgh. (V.-P. 1881-2.)

O.M. Rockliffe, W. C., M.D., Ophthalmic Surgeon to the Hull Royal Infirmary ; 9, Charlotte Street, Hull.

1884 Rogers, Hildyard, 43, Uxbridge Road, W.

1885 Rose, James, Ophthalmic Surgeon, Bootle Hospital; Assistant Surgeon, Eye and Ear Infirmary, Liverpool ; 1, Great George Square, Liverpool.

1885 Ross, James, M.D., Physician to the Manchester Royal Infirmary and Professor of Medicine, Victoria University; 14, St. John Street, Manchester.

ELECTED

1882 †Roth, Reuter E., 42, College Street, Hyde Park, Sydney, New South Wales.

1881 †Rudall, J. T., 121, Collins Street, East, Melbourne, Australia.

1888 Sanders, Richard C., M.D., Medical College, Calcutta.

1884 Sandford, Arthur V., M.D., Surgeon to the Cork Ophthalmic and Aural Hospital; St. Patrick's Place, Cork.

1881 Sansom, A. E., M.D., Physician to the London Hospital; Physician to the North-Eastern Hospital for Children; 84, Harley Street, W.

O.M. Savage, G. H., M.D., Lecturer on Mental Diseases at Guy's Hospital; 3, Henrietta Street, Cavendish Square, W.

1885 Scougal, Edward Fowler, M.B., Brooklands, Gledholt Road, Huddersfield.

O.M. Sharkey, S. J., M.D. (C.), Assistant Physician, Joint Lecturer on Pathology and Demonstrator of Morbid Anatomy, St. Thomas's Hospital; 2, Portland Place, W. (S. 1885-8.)

1883 Shears, Charles, Senior Assistant Surgeon to the Liverpool Eye and Ear Infirmary; 1, St. James's Road, Rodney St., Liverpool.

1883 Silcock, A. Q., M.D., Surgeon to St. Mary's Hospital; Assistant Surgeon to the Royal London Ophthalmic Hospital; 101, Harley Street, W.

1883 Skinner, D. S., M.D., Westbury House, Harrow Road, Willesden, N.W.

1883 Smith, R. Percy, M.D., Assistant Medical Officer, Bethlem Royal Hospital, S.E.

O.M. Smith, Priestley (V.P.), Ophthalmic Surgeon to the Queen's Hospital, Birmingham; 34, Paradise Street, Birmingham. (C. 1883-6.)

1881 Smith, T. Gilbart, M.D., Physician to the London Hospital; 68, Harley Street, W.

ELECTED

O.M. Snell, Simeon, Ophthalmic Surgeon to the Sheffield General Infirmary; 17, Eyre Street, Sheffield. (C. 1884-7.)

O.M. Square, W., Surgeon to the Plymouth Royal Eye Infirmary; 14, Portland Square, Plymouth.

1886 Stephenson, Sydney H. A., The Infirmary, Lambeth Industrial Schools, West Norwood.

1887 †Stirling, J. W., M.B., 873, Dorchester Street, Montreal, Canada.

O.M. Story, J. B., Surgeon and Clinical Lecturer on Ophthalmic and Aural Surgery at St. Mark's Ophthalmic Hospital; 24, Lower Baggot Street, Dublin. (C. 1885-8.)

O.M. †Sturge, W. A., M.D., 15, Rue Longchamp, Nice, Les Alpes Maritimes.

1883 Sutton, S. W., M.D., Quetta, Afghanistan.

O.M. Swanzy, H. R., Surgeon to the National Eye and Ear Infirmary, Dublin; Professor of Ophthalmic and Aural Surgery to the Royal College of Surgeons, Dublin; 23, Merrion Square, Dublin. (V.-P. 1880-1.)

1883 †Symons, Mark Johnston, M.D., Ophthalmic Surgeon to the Adelaide Hospital; North Terrace, Adelaide, South Australia.

1886 Sympson, E. Mansel, M.B., St. Bartholomew's Hospital.

O.M. Sympson, Thomas, Surgeon to the Lincoln County Hospital; 2 and 3, James Street, Lincoln. (C. 1884-5. V.-P. 1885-8.)

O.M. Tay, Waren, Surgeon and Ophthalmic Surgeon to the London Hospital; Surgeon to the Royal London Ophthalmic Hospital, Moorfields; 4, Finsbury Square, E.C. (C. 1880-2.)

1882 Taylor, C. B., M.D., Surgeon to the Nottingham Eye Infirmary; 9, Park Row, Nottingham.

O.M. Teale, T. Pridgin, F.R.S., Surgeon to the Leeds General Infirmary; 38, Cookridge Street, Leeds. (V.-P. 1880-1.)

ELECTED

O.M. Thomas, Jabez, Surgeon to the Swansea Hospital and Eye Infirmary; Ty-Cerrig, Swansea.

1885 Thompson, C. S., Bideford, Devon.

1888 Thompson, John Tatham, M.B., Ophthalmic Surgeon to the Cardiff Infirmary and to the South Wales Institute for the Blind; 23, Charles Street, Cardiff.

O.M. Tibbits, Herbert, M.D., Senior Physician to the West End Hospital for Diseases of the Nervous System; 68, Wimpole Street, W.

1883 †Tobin, William, 31, Hollis Street, Halifax, Nova Scotia, Canada.

1883 Tooth, Howard H., M.D., Assistant Physician to the National Hospital for the Paralysed and Epileptic and to the Metropolitan Free Hospital; 34, Harley Street, W.

O.M. Tosswill, L. H., Surgeon to the West of England Eye Infirmary, 28, West Southernhay, Exeter.

O.M. Tweedy, John, Assistant Ophthalmic Surgeon to University College Hospital, and Professor of Ophthalmic Medicine and Surgery at, University College; Surgeon to the Royal London Ophthalmic Hospital, Moorfields; 100, Harley Street, W. (C. 1884-7.)

1883 Uhthoff, J. C., M.D., Surgeon to the Sussex and Brighton Eye Infirmary; 9, Brunswick Place, Brighton.

O.M. Vernon, Bowater J., Ophthalmic Surgeon to St. Bartholomew's Hospital, and to the West London Hospital; 14, Clarges Street, Mayfair, W.

1887 Wainewright, Benjamin, M.B., 6, Harley Street, W.

O.M. Walker, G. E., Surgeon to St. Paul's Eye and Ear Hospital, Liverpool; 43, Rodney Street, Liverpool.

O.M. Watson, W. Spencer, Surgeon to the Great Northern Central Hospital and Royal South London Ophthalmic Hospital; 7, Henrietta Street, Cavendish Square, W. (C. 1883-6.)

1887 Wells, Arthur P. L., M.B., 3, Belsize Park, N.W.

ELECTED

1885 Werner, Louis, Ophthalmic Surgeon to the Mater Misericordiæ Hospital; 22, Ely Place, Dublin.

O.M. West, S. H., M.D. (C.), Assistant Physician to St. Bartholomew's Hospital; 15, Wimpole Street, W.

O.M. Wherry, G. E., M.B., Surgeon to Addenbrooke's Hospital; 53, Trumpington Street, Cambridge.

1882 Wilkinson, T. M., Surgeon to the Lincoln County Hospital; Lindum Road, Lincoln.

O.M. Williams, R., Surgeon to the Liverpool Eye and Ear Infirmary; 82, Rodney Street, Liverpool.

1888 †Willis, C. Fancourt, M.D., Bombay, India.

O.M. Woodhead, G. Sims, M.D., 6, Marchhall Crescent, Edinburgh.

RULES.

1. The object of the Society is the cultivation and promotion of Ophthalmology in the United Kingdom, India, and the Colonies.

2. The Society shall consist of Ordinary and Honorary members. All legally qualified medical practitioners shall be eligible as ordinary members.

3. The officers of this Society shall consist of a President, four or more Vice-Presidents, a Treasurer, two Secretaries, a Librarian, and twelve other members, who together shall form the Council and manage the Society's affairs.

4. *Election of Members.*—Candidates shall be proposed on a form provided for the purpose and signed by three members from personal knowledge. The proposal paper shall be read at one Ordinary Meeting, and the Ballot shall be taken at the following Meeting. No election shall take place unless ten members vote, and no person shall be elected who does not obtain four fifths of the votes given.

5. *Form of Admission by the Chairman.*—Members shall be admitted personally by the following form, after signing their names in the Admission Book, and paying their first Annual Subscription. *Form of admission.*—"By the authority and in the name of the Ophthalmological Society of the United Kingdom, I admit you a member thereof."

6. *Honorary Members.*—The Council shall have the power of proposing men of distinguished eminence in Ophthalmology, or in the sciences bearing upon it, not exceeding ten in number, for election as Honorary members. They shall be elected in the same manner as Ordinary members.

7. *Expulsion of Members.*—A member can be expelled only at a General Meeting specially called for that purpose, and of which a written notice shall have been sent to every member at least fourteen days previously. At least ten votes must be recorded, and four fifths shall carry the expulsion.

8. *Subscriptions.*—The Annual Subscription shall be One Guinea, payable in advance at the date of the Annual General Meeting. Each member on election shall pay an Entrance Fee of One Guinea in addition to the Subscription, but in the case of a member elected at a meeting of the Session subsequent to Easter he shall not be required to pay a Subscription during the next Session. Any member whose Subscription is six months in arrear shall be reminded of the same by one of the Secretaries, and if it be not paid within the current year he shall cease to be a member. Any member may, at any time, pay a Composition Fee of Fifteen Guineas and be thereby exempted from paying any further Subscriptions, such member enjoying all the same rights and privileges as if he were a Subscribing member. Any member resident out of the United Kingdom may pay a Composition Fee of Five Guineas instead of the Annual Subscription, and will then be entitled to receive, post free, a copy of the Society's 'Transactions' each year, and to have his name printed in the list of members; but if at any time he subsequently become a Resident member of the Society, the question of further payment by him shall be decided by the Council. N.B.—The Composition Fee in either instance will include the Entrance Fee.

9. The Officers of the Society shall be elected yearly by Ballot at the Annual Meeting, to which all the Ordinary members shall be summoned one week before. No gentleman shall hold the same office for more than three consecutive years. Balloting lists of the names recommended by the Council for election shall be sent to each Ordinary member, together with the notice of the Annual Meeting.

10. Two Scrutineers appointed by the Chairman at the commencement of the Annual Meeting shall receive the lists during the first hour, and report the result to the Chairman. In the event of equality of suffrage the Chairman shall determine.

11. *The President and Vice-Presidents.*—The President shall regulate all the proceedings of the Society and Council, state and put questions, interpret the application of the Laws, and decide any doubtful points. He shall check irregularities and enforce the observance of the Laws. He shall sign the minutes of General and Council Meetings. In the absence of the President one of the Vice-Presidents, the Treasurer, or some other member chosen by the Meeting, shall perform his duties.

12. *The Secretaries* shall manage all correspondence, shall attend every meeting of the Society and Council, and take minutes, which shall be read at the following meeting. They shall notify to new Members their election. They shall arrange with the President the order of proceedings at all the meetings. They shall have charge of,

and keep a register of, all papers communicated, and shall be the Editors of the 'Transactions.'

13. *The Treasurer* shall receive all moneys due to the Society, and make all payments ordered by the Council, keeping an account of all such receipts and payments. He shall keep a printed receipt book for the subscriptions, and every receipt shall be signed by himself and countersigned by one of the Secretaries. He shall present to the Annual Meeting a written Report of the financial state of the Society, signed by himself and by two members of the Audit Committee.

14. *The Librarian* shall have entire charge and control of the Library. He shall purchase books for the Library as opportunities arise at his discretion out of the grant previously voted for this purpose by the Council. He shall see that all books belonging to the Society are duly entered in the Catalogue, and that the periodicals and pamphlets are from time to time, as occasion may require, suitably bound. It will be his duty to see that the Library Rules are not infringed.

15. *Audit Committee.*—The President, one of the Secretaries, and two Members of the Society nominated by the President at some meeting of the Society previous to the Annual Meeting, shall form a Committee to audit the Treasurer's accounts.

16. The Council shall meet half an hour before the meeting in October, January and May, and half an hour before the Annual General Meeting, and at such other times as they may be specially convened. Three shall form a quorum. The Council shall determine questions by show of hands (or by Ballot if demanded), the President having in both cases a casting vote in addition to his ordinary vote. They shall have the power of filling up any vacancies which may occur in any of the offices of the Society between one Annual Meeting and another. They shall decide upon all questions relating to the reception of communications and to their publication in the Society's 'Transactions.'

17. '*Transactions.*'—A copy of the 'Transactions' shall be sent to each Member of the Society.

18. The Ordinary Meetings shall be held from 8.30 to 10 p.m. on the third Thursday in October, the second Thursday in November and December, the last Thursday in January, the second Thursday in March, the first Thursday in May, and the second Thursday in June. The Annual General Meeting shall be held on the Friday after the first Thursday in July.

19. *Visitors.*—Each Member may introduce two visitors on writing their names in the attendance book.

20. *The business at Ordinary Meetings* shall consist in the reading and discussion of papers, which may be illustrated by specimens, drawings, &c. When patients are to be shown they should attend half an hour before the meeting.

21. Communications shall be taken in the order in which they have been sent in to the Secretaries, subject to the discretion of the President. If an author be not present when the time arrives for his communication to be read, it shall be dealt with as the President may direct.

22. All papers, except those relating to living specimens, must be sent to the Secretaries at least one week before the meeting, together with an abstract suitable for immediate publication in the journals.

23. Nothing relating to the Laws or management of the Society shall be considered at Ordinary Meetings.

24. At the Annual General Meeting proposed alterations of Rules shall be considered and decide upon, notice of such alterations having been given in the summons convening the meeting. Ten shall form a quorum at this meeting, and for the adoption of any alteration of the Laws four fifths of the votes given must be in its favour.

25. A special General Meeting may be called at any time, on one week's notice, by the President or any three members of the Council. the nature of the business being specified in the summons sent to each Member of the Society, and no other business being considered.

LIBRARY RULES.

1. The Library shall be open at the same hours as that of the Medical Society, viz. from 1 p.m. to 6 p.m. daily, except on Saturdays, when it will be closed at 3 p.m.

2. Members will be entitled to read the books belonging to the Society at 11, Chandos Street, between those hours, or to take them out on signing a form provided for that purpose. But any books of extraordinary value may be placed by the Council on a separate list, such books not being allowed to be removed from the Library.

3. A large number of the current periodicals will be accessible to Members in the Library. These will not be allowed to be taken out of the Library.

4. A book must be returned at the expiration of a fortnight if

wanted by any other Member. The Librarian will in such a case write to the Member in whose name the book was taken out.

5. If the book be not returned within four days of such notice a fine of 6d. will be charged for each day that the book is retained beyond such days of grace.

6. Instruments and drawings cannot be taken out of the Library except with the express permission of the Council.

7. A Member taking out a book will be held responsible for its being returned in good condition.

THE BOWMAN LECTURE.

Resolution of Council, September 18th, 1883.

"That in recognition of Mr. Bowman's distinguished scientific position in ophthalmology and other branches of Medicine, and in commemoration of his valuable services to the Ophthalmological Society, of which he was the first President, the Council shall each year, or periodically, nominate some person to deliver a lecture before the Society to be called 'The Bowman Lecture,' which shall consist of a critical *résumé* of recent advances in ophthalmology or in such subject or subjects as the Council shall select, or of any original investigation, and shall be delivered at a special Meeting of the Society held for the purpose, at which no other business shall be transacted."

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RELATION OF OPHTHALMIC DISEASE

TO

CERTAIN NORMAL AND PATHOLOGICAL CONDITIONS OF THE SEXUAL ORGANS,

BEING

THE BOWMAN LECTURE,

Delivered Friday, November 11th, 1887,

By Henry Power, M.B.Lond., F.R.C.S.

Mr. President,—Allow me in the first place to thank you, sir, and the Council of the Ophthalmological Society, for the distinguished honour conferred upon me in entrusting to my hands the "Bowman Lecture" for the present year. No one can, I think, occupy the position I now hold without a feeling of trepidation at the task he has undertaken—the task of placing before a Society of experts the results of some of his own observations on subjects with which they are as familiar as himself, and regarding which it is as difficult to make general statements which shall not be platitudes as to adduce special cases which shall not be tedious, uninteresting, and uninstructive. With the multitude of observers in every civilised country who, with the best appliances, are now engaged in the practice of ophthalmic medicine and surgery, few indeed can hope to present to his brethren

any anatomical description that shall compare with the short but pregnant chapters on the parts concerned in the operations on the eye by the distinguished surgeon after whom this lecture is named, any new instrument approaching in value the ophthalmoscope, any mode of treatment approximating in importance the application of cylindrical glasses for certain errors of refraction, or who can indicate and support by reference to numerous carefully collected cases the relations that exist between certain affections of the eye and such a specific constitutional disease as syphilis. I feel that I must at least be contented with a humbler *rôle,* and I have ventured to take as my theme the relations of the diseases of the eye to the normal and pathological conditions of the sexual organs—a subject which, although discussed in several monographs, is only briefly referred to in modern text-books, and yet which seems to present many points of interest.

The generative system, developed essentially from the mesoblastic layer of the embryo, remains undeveloped, with its function in abeyance, to the age of thirteen or fourteen years in girls and of fourteen or sixteen years in boys, though, of course, slow maturation of the spermatoblasts in the one sex and of the primordial ova in the other is taking place from birth to puberty. During infancy and childhood no influence of the sexual system on affections of the eye can be demonstrated, nor can any difference be shown to exist in this respect between boys and girls. After this period, however, the changes induced in the economy by the development of the sexual organs, exert a powerful influence on the forms presented by ophthalmic diseases in general and give rise to marked contrasts in the affections of the eye in the two sexes. Hence it will be well to make a primary division of the subject into the relation of the sexual organs to the eye in males and females respectively, and then to follow, so far as practicable, the forms of disease which occur at different periods of life and in different conditions of the system.

The influence of the sexual system upon the eye in

man is far less potent, and the connexion is consequently far less easy to trace, than in woman. No doubt even moderate sexual indulgence exhausts the physical power: "Omne animal post coitum triste est," says the old adage; and if the indulgence be extreme various troubles to which I shall presently refer are experienced; but in young unmarried and continent men the customary rare and spontaneous emissions of semen, which are the correlatives of the menstrual discharge in women, have no perceptible effect upon the general health, and far less upon the structure or function of the eye. In women, on the other hand, the influence of the sexual system, in accordance with its more complex structure, its larger bulk, and much greater nervous and vascular supply, together with its wider sympathies, is much more profound. That this circumstance did not escape the observation of the older physicians is sufficiently attested by the remark of Hippocrates—"Propter uterum mulier tota est morbus;" or that of v. Helmont—"Propter solum uterum mulier est quod est." It is, indeed, one of the arguments against the higher education of women that, with some remarkable exceptions, the normal performance of the act of menstruation tells on the economy, rendering even very strong women less capable of mental and physical exertion, owing to pain, languor, and diarrhœa; whilst the defective, excessive, or difficult and irregular discharge of the function is constantly followed by derangement of some part of the organism, and not unfrequently of the eye. And if this be true of the detachment of the unimpregnated ovum, how much deeper and more important an influence must be the effect of that great effort of the system by which a new creature is generated, nourished, and cast forth by the immensely developed pregnant uterus.

The supervention of puberty in boys is attended with rapid growth of the body in height and weight, and in some instances, though not always, with increased mental activity. I say in some instances, because not unfrequently the rapidly growing boy is dull and languid, and

really requires protracted sleep—a point too much neglected by parents and schoolmasters. The practice of masturbation at this period has been considered by many observers to be a fertile source of ophthalmic trouble. The effects have been particularly discussed by Cohn,* Boggs,† Fitzgerald,‡ Mooren,§ and Hutchinson.‖ The principal symptoms noticed by these authors are of a functional character. Thus Cohn's cases indicated retinal irritation. They were seven in number, of whom four were boys, and the chief symptoms he noticed were photopsiæ, muscæ, and muscular asthenopia. The vision was not in any instance deteriorated; it was of normal acuteness in all. The photopsiæ that were complained of consisted in the appearance of stars, and bright, sometimes coloured, dots, rings, snowflakes, and the like, and an unpleasant dazzling. Hutchinson observed, in addition to similar symptoms, that the patients complained of stiffness and peculiar sensations about the lids. Examination with the ophthalmoscope affords little or no information. The media may be perfectly clear, and the disc, retinal vessels, retina, and choroid present no indications of disease. The symptoms seem to be essentially dependent on anæmia and nervous exhaustion, or at least upon conditions of disturbed circulation in the retina and visual centres.

Several inflammatory or subinflammatory symptoms have been noticed by different authors. Thus Förster and Cohn both maintain that there is a connexion between persistent conjunctival inflammation and masturbation, and they adduce cases in which hyperæmia, follicular and catarrhal inflammation, and even trachomatous infiltration of the conjunctiva, resulted, or appeared to result, from the habit. The evidence on which reliance was placed

* 'Archives of Ophthalmology,' 1882, p. 428.

† Galezowski's 'Recueil,' 1881, p. 692.

‡ 'Transactions of the Ophthalmological Society,' vol. iii, p. 178.

§ 'Ophthalmic Hospital Reports,' vol. xi.

‖ Lecture, 1875.

that these affections were due to masturbation, was that masturbation was practised, that the inflammation was persistent and intractable under ordinary treatment, and that when the habit was discontinued the ophthalmic disease subsided and ultimately disappeared.

Both Michel and Cohn have noticed blepharospasm. They admit, however, that the evidence was not very satisfactory; for although many cases of blepharospasm occurred in which it was also stated in the notes that "excessive onanism" was practised, yet there was no evidence of improvement when the habit was given up. It must not be forgotten that blepharospasm is a common accompaniment of errors of refraction, and that any circumstance which would tend to weaken the bodily powers would intensify the symptoms arising from such defect. Moreover, there are other general states of the body which might be the efficient cause of the spasm, the exclusion of which in any given case would require a much more exhaustive examination than is given in the histories of these cases. Cohn states that the subjects were mostly boys or young men from eight to twenty years of age, who appeared delicate. In most instances the spasm affected both eyes, though occasionally only one was attacked.

In the paper read before this Society by Dr. Fitzgerald, and printed in the 'Transactions,' he has given an account of the results of masturbation in three young ladies. In one of these there was intense neuro-retinitis of one eye; in the second, with hysterical symptoms, there were at first no ophthalmoscopic signs beyond slight haziness and pallor of the optic discs, but white atrophy of both discs subsequently occurred; and the third presented hyperæmia of the disc with asthenopic symptoms. In the first case visual acuteness in the affected eye was reduced to counting fingers, but with restitution of the menses recovery rapidly followed. In the second case, total blindness resulted. It will be noted that the physical lesions, as well as the impairment of vision, were greater

in Dr. Fitzgerald's than in Cohn's cases; but Dr. Fitzgerald himself admits that his second case, which terminated in white atrophy, might have arisen from some other cause.

I may mention that I have seen one case of a rare disease, agoraphobia (or dread of open spaces), in a man aged thirty-two, who himself attributed it to extreme nervousness engendered by excessive masturbation in youth. He could live in comfort in towns, and was happy in crowded streets. The presence of lofty buildings removed all his anxiety, but in the country, and especially in an open plain, he was overcome with fear and apprehension, and life was a burden to him. There was in this case a considerable degree of amblyopia, vision being reduced to $\frac{1}{20}$th. The attacks of agoraphobia were irregular in their occurrence and in their duration. He complained of seeing numerous muscæ, some bright, like diamonds, and some dark, like smuts. He was myopic, and used −4·5 D., but there was no apparent disease of the fundi.

Upon the whole, I am inclined to think the effects of masturbation have been exaggerated. No doubt when self-abuse is frequently practised—and cases are given where it was repeated several times daily—harm may result, and possibly even white atrophy of the disc be produced; but we may be sure that such cases are very rare; and it is to be remembered that the glands are active in youth, their activity being, in fact, the stimulus to the vice, whilst any injurious influence is probably first evident in loss of accommodation and the usual symptoms of accommodative and muscular asthenopia, a symptom that alarms the patient, and is likely to lead him to discontinue the habit before any permanent harm is done to the system or eye. I have found (and others, I have no doubt, have also found) that it is difficult to institute any inquiries in this direction. If the lad is young and pure-minded—and let us hope there are many such in England—one feels that it is injudicious to suggest

what may be unknown; and, on the other hand, if the boy be naturally vicious, it is probable he will not hesitate to lie. In the few cases in which, from special circumstances, I have arrived at the conclusion that self-abuse was practised, or respecting which I have received some hints from parents, or have been told outright by the patient hinself, no serious or permanent injury to the eye seemed to me to have resulted. The condition was rather fear of what might happen, perhaps induced by reading the pamphlets of quacks and charlatans, than that any disease had been produced. In the case of girls, I must frankly admit that it seems to me impossible to ask any questions on the subject at all, and I have not even dared to interrogate the mother. If it is difficult to institute inquiries upon this point, there is, I think, a mode of treating it which commends itself to my mind as being both simple and successful, whilst it can be equally applied to either sex. It consists in directing that on retiring to rest the arms should be kept outside the bedclothes. In cold weather a jersey may be worn. This plan, with due attention to physical exercise, the relief of constipation and the avoidance of too great mental excitement, has, I know, been successful in some cases.

At the age of puberty, or a little later in boys, I have seen cases of hæmorrhage on the retina, the cause of which was very obscure, but which I was disposed to attribute to constipation of the bowels—a condition that may itself result from masturbation. One such case I showed to the Society a year or two ago, in which no renal trouble could be discovered, yet in which there were numerous hæmorrhagic and white patches, which have yet not wholly disappeared. Through the kindness of Dr. Mackinlay I have this very day seen a case of hæmorrhage upon or in the retina, and large flocculi in the vitreous of a lad nineteen years of age, thin and ill developed, who, whilst admitting frequent masturbation, presented good teeth, healthy urine, and general freedom from disease, whilst refraction was hypermetropic.

I do not propose to enter into any detailed account of the effects upon the eye of such morbid conditions of the sexual organs in either sex as gonorrhœa and syphilis, since their consideration would open up a field far too wide to receive adequate treatment within the limits of an hour's lecture; but I would point out that these conditions are frequently initiated between the ages of eighteen and twenty-five, the results of such inoculation leading at first to iritis and its consequences, but often affecting that organ secondarily by inducing some slowly progressive disease, such as locomotor ataxy or some other serious nervous affection. The sad results of many of these cases constitute one of the most cogent arguments for the re-enactment of the Contagious Diseases Acts, the abolition of which, in deference to ignorant and senseless popular clamour, all practitioners must deeply deplore. How beneficial they were I may be allowed to state from my own experience at Chatham, which I am sure will be endorsed by the thoroughly practical and highly intelligent house-surgeon of St. Bartholomew's Hospital, Chatham, Mr. Nankivell. When I first attended that hospital some fifteen years ago syphilitic affections of the eye were common; the Acts were passed, and for several years diseases of the eye dependent upon syphilis all but vanished; the Acts were repealed and they reappeared, and Mr. Hartridge, who now holds the post of honorary ophthalmic surgeon to that hospital, assures me they are now common.

Of the disorders of vision which are attributed by the patient of youthful or middle age to sexual excess, both legitimate and illegitimate, amblyopia, the appearance of muscæ, and loss of accommodation are the most common. Of such excesses I suppose most of us have heard revolting details enough. But occasionally more serious results may follow. I saw one case of great pallor of the optic disc in an officer home on leave from India, in whom I am inclined to think the condition of the discs, with the great impairment of vision that accompanied them, were

produced by six weeks' sedulous devotion to the pleasures and vices of London life. I was assured in that case that he had led a life of perfect continence for several years in a remote country district in India, and that his vision had on his arrival in this country been perfect. In that instance vision recovered its normal sharpness when the cause of the impairment was pointed out and removed, though the discs remained pale.

The departure of sexual power is so gradual in men that it is hard to indicate any relations between its loss and ophthalmic disease. I have, however, occasionally seen cases of widowers who complained of anomalous symptoms, such as pain in and around the eyes, and confusion of vision, which they attributed, perhaps rightly, to sudden and prolonged suppression of accustomed seminal discharges. I have certainly seen cases of white atrophy of the optic discs in old men who had been indiscreet enough to marry young and prepossessing women. Perhaps previously existing disease in these cases was aggravated by the proceeding. Tissot gives a case (and others are quoted by Hoffman of an analogous kind) in which a man, aged fifty-nine, three weeks after marrying a young woman, became suddenly blind, and died in four months.

Turning now to the opposite sex, it may be remarked, in the first place, that the great changes occurring in the whole system of a woman at the period of the establishment of the catamenia are not likely, as I have pointed out, to be without their influence on the eye. The experiments of Röhrig have demonstrated the effects that are obtained by electrical stimulation of the ovaries, such stimulation in the rabbit causing a rise of blood-pressure from 12 mm. to 24 mm. of mercury. And we accordingly find that several conditions of disorder or disease of the eyes are met with at this period, whilst functional disturbance of the act of menstruation is constantly a source of visual trouble. At this time, under normal and healthy conditions, the process of growth and development are more rapid and vigorous than at any other period of life.

The appetite is increased; much more work is thrown upon the digestive organs; assimilation is at its height; the quantity of blood and the activity of the circulation are augmented; the excitability of the nervous system, as manifested by the exaltation of the emotional activity, is greatly increased; there is a tendency to local congestion of different organs before the uterus accepts its function, which is exhibited by diarrhœa, headaches, or abdominal pains, which at length culminate in, and become restricted to, the menstrual discharge. It is not surprising, then, that when any circumstance interferes with the institution of the function, the close and extensive plexus of the choroidal vessels becomes surcharged with blood, and that occasionally one or more of these should give way, permitting their contents to escape into the vitreous humour. In such cases the patient, after some premonitory symptoms,—as headache, vertigo, fainting, inability to exert the mind,—complains of sudden impairment of vision. This is often at first slight, and either no change may be perceived with the ophthalmoscope, or the alteration may only reveal itself by some slight haziness to the observer, or by the presence of muscæ and lines or webs to the patient; but after one or two ineffective returns of the effort to menstruate, a more copious effusion may take place, rendering the media so obscure that the details of the fundus are wholly unrecognisable, a dim reflex being alone perceptible. In some cases, perhaps in most, this may clear up, and vision by degrees, and after the lapse of a considerable period, become normal; but I have seen several instances where the eye has never regained its former visual power. Cases of choroiditis, analogous to those to which I have just referred, may be found in many treatises, and an examination of them will show that the congestion and effusion or inflammation sometimes affects the anterior region of the choroid, sometimes the posterior; that it may be circumscribed and small in extent, or diffused, and affecting apparently the whole membrane; that it may be accompanied by actual hæmorrhage, or

that there may be effusion of lymph only; and that it may terminate either in perfect recovery or with some deterioration of vision, which may be general or limited to a certain area of the field, or, lastly, in loss of vision with white atrophy of the optic disc. The effusion that takes place in these cases is probably in most instances of the nature of lymph; at least, the reflex is dark and not ruddy in tint; but now and again actual blood is poured out, and I exhibited to the members of this Society two years ago a healthy and apparently well-developed girl, in whom a large clot of blood of crimson colour was visible immediately behind the lower segment of the iris. This presented the extraordinary feature that whilst undergoing little change in its form or size it retained its colour unaltered for more than a year, and only slowly disappeared by diffusing itself into the substance of the vitreous. When the resulting opacities had cleared up the fundus presented the remarkable appearance represented in Plate III. I may just add to my former account of the case the fact that the eye now presents normal aspect, and that the vision is $\frac{6}{18}$ in the affected eye. A very similar case of hæmorrhage into the vitreous in a girl of fourteen, which took place prior to the establishment of menstruation, is recorded by Oursel. M. Dor* also gives the case of a girl in whom the catamenia had not yet appeared, but who presented hæmorrhages in each vitreous, the blood disappearing and reappearing at intervals. When menstruation at length supervened with regularity, the hæmorrhages and the amblyopia which invariably accompanied them disappeared and did not again return. Occasional hæmorrhages into the parts surrounding the eyes occurring at a later period of life in cases of amenorrhœa and of dysmenorrhœa have been placed on record. Fritz gives a table compiled by Puech, from which it appears that in 200 cases of disturbance of the menstrual function there were ten cases of hæmorrhage from the lids and caruncle.

Amongst the affections which are believed by some ob-

* Galezowski's 'Recueil,' 1884, p. 164.

servers to be associated with amenorrhœa, phlyctenular ophthalmia may first be mentioned ; but it may reasonably be questioned whether it is a direct or an indirect effect of menstrual disturbance. The difficulty which leads one to reject many cases that seem at first sight to be supported by clear evidence is the difficulty by which we are so frequently confronted, the concurrence of several causes, amongst which it is difficult to select the efficient one. A woman may be amenorrhœic or may suffer from dysmenorrhœa, and the eyes may present such affections as keratitis, choroiditis, or optic neuritis ; but it does not follow that either of these diseases is the direct consequence of the amenorrhœa or dysmenorrhœa. It may result from dental disease or from intestinal irritation, or may be the consequence of some affection of the nervous centres ; or, as Mr. Habershon laboured to prove at our last meeting, there may be strong hereditary predisposition to ophthalmic disease, which, though latent, is ready to develop on slight provocation. A case cited by M. Oursel, which he regards as typical, is that of a young girl with a good family history, who was accustomed to suffer at her menstrual periods severe neuralgic pain in the face. At about the age of sixteen she was subjected to violent emotional excitement, and as a result suffered from amenorrhœa, with much pain, nausea, and vomiting, and phlyctenulæ appeared on one eye, and from this time forth for six months or more pustules formed at the period when the catamenia should have occurred, sometimes on the right, sometimes on the left eye. After an unusually severe attack the girl applied to M. Coursserant for relief. Bitter tonics, friction of the skin, revulsives to the lower extremities, fumigations of the vagina with aromatic plants, and the administration of aloetic purges re-established the menstrual flow, and with the recurrence of this discharge the phlyctenulæ ceased to appear. This, no doubt, is a fairly typical case, and the eye symptoms may reasonably be regarded as directly connected with the amenorrhœa ; still, it may just be pointed out that no

mention is made of the condition of the teeth, or of the presence of irritation or disease of the intestinal mucous membrane, or of the state of the heart and other organs, though it is possible that all these may have been investigated and these with other sources of trouble excluded.

Mooren finds diseases of the sclerotic, and especially episcleritis, to be more common in women than in men, and thinks that it is associated with menstrual disturbance. I consider episcleritis to be a rheumatic affection, and believe that it is generated by exposure to wet and cold in a state of exhaustion, and can quite believe that it is more likely to be induced, or, if present, for the symptoms to be exaggerated, when the system is enfeebled by the presence of the catamenia, but should hesitate to accept uterine disease as anything more than a predisposing cause of its occurrence.

An exceedingly interesting *résumé* of the affections of the cornea, and especially of interstitial keratitis, in regard to sex and age, has been drawn up for me by Mr. Andrew E. Wynter, from the ward books of the ophthalmic department of St. Bartholomew's Hospital. I cannot express the results better than he has done :

Number of Cases of all kinds of Keratitis in Males and Females at different ages.

Age.	Male.	Female.	Proportional decimal[1] Male.	Female.
— to 10 ...	42 ...	77 ...	0·304 ...	0·37
11 to 20* ...	37 ...	73 ...	0·265 ...	0·356
21 to 40 ...	39 ...	39 ...	0·28 ...	0·19
41 to 50† ...	9 ...	5 ...	0·067 ...	0·024
50 to — ...	11 ...	11 ...	0·08 ...	0·053
Total	138	205		

The table shows that : 1. There are many more cases (205 females to 138 males) of keratitis occurring in females

* Menstruation commencing.

† Climacteric.

than males. 2. That the difference is most marked in the decade previous to and contemporaneous with the decade of commencing menstruation (150 females to 79 males). 3. That in the first decade 30 per cent. males to 37 per cent. females of the whole number occur. 4. That in the decade of commencing menstruation there is a distinct difference in the percentage of males and females; thus in males it is only 26 per cent., while in females it is 35 per cent., an increase of nearly 10 per cent., due to, or certainly contemporaneous with, the period of commencing menstruation. 5. That during the menstrual period of life (twenty to forty) there is a diminution among females compared with the same time of life in males. Thus in females 19 per cent. occur between the ages of twenty to forty years, as against 28 per cent. for the same period in males. 6. That at the age of the climacteric (from forty-one to fifty) there is a sudden fall in the percentage, the males being higher (6·7 per cent.), the females being 2·4 per cent. After fifty there is a rise in the number of cases in both sexes, males being still greater. Thus, males 8 per cent., females 5·3 per cent. 7. That it is curious to note the fact that, in spite of the greater exposure, &c., in males, the female cases have a greater sum total, suggesting that women are more liable to keratitis than men. 8. In some cases occurring between twenty to forty years in women, over-lactation or bad confinements have been given as the constitutional causes.

An examination of our ward books further shows that interstitial keratitis is more frequent in women than men, omitting cases of keratitis punctata, traumatism, and keratitis due to (*a*) granular lids, (*b*) mercurial poisoning, and (*c*) lesions of the fifth nerve, the chief difference lying at about the on-come of menstruation (*i. e.* ten to twenty), 28 females to 13 males. 2. That the average age for men to be attacked with interstitial keratitis is $17\frac{9}{25}$ years, whilst the average age for women is $15\frac{31}{38}$ years. So that women are attacked a year and a half earlier, the average

being brought down by the great number occurring about the supervention of menstruation. 3. No cases occurred at the climacteric.

Galezowski* and Daguenet† have recorded several cases of disease of the cornea resulting from sudden suppression of the menses. The patient in M. Daguenet's case was thirty-seven years of age, married, but childless. Whilst in perfect health she was exposed to cold in washing linen in the month of January. Suppression of the menses followed, and in the course of the night she was awakened by intense pain in the left eye. The whole left globe was inflamed, and a large abscess formed in the substance of the cornea followed by leucomata, which, however, cleared up sufficiently to enable the patient to pursue her avocation.

Mooren gives the case of a girl of fourteen who had an intense keratitis pannosa, and who, notwithstanding the fact that every symptom of her molimina menstrualia was present, could not be brought to menstruate; yet a recurrence of the inflammation occurred every four weeks, and treatment, continued for a year, proved entirely ineffectual. When menstruation did occur, a sudden change took place; but the tissue of the right cornea was so altered that although it remained transparent it became conical. I entertain no doubt that the age of puberty in girls, and probably in boys also, is one in which interstitial inflammation of the cornea is particularly apt to occur, and at that period in delicate children suffering from inherited syphilis the attack may be extremely severe. I remember one case in particular of a girl of fourteen, in whom menstruation had just commenced, and who was exposed to cold and a somewhat spare diet. The cornea, after becoming cloudy, was invaded by vessels which were so numerous that only perception of light remained in the eyes. I despaired of the recovery of vision, and she began to learn the alphabet for the blind. With the

* 'Recueil,' 1875.

† 'Recueil,' 1876–77, p. 194.

establishment of the menses, however, improvement commenced, and by degrees, with appropriate treatment, vision was absolutely and perfectly restored. Thaon* also points out that interstitial keratitis may be coincident with the supervention of menstruation. Mooren† on the other hand, gives a good case of double interstitial keratitis, in which the symptoms greatly increased in intensity during the menstrual period.

Iritis of a serous type, affecting sometimes one, sometimes both eyes, has been described by many writers as a concomitant of amenorrhœa and of dysmenorrhœa. The causes of the uterine trouble have been very various: mental shocks and worry, and sudden exposure to cold, are amongst the most common; and the results have been sometimes satisfactory, sometimes serious.‡

In Thaon's case amenorrhœa was suddenly occasioned by grief at the loss of a child. Some pain in the eyes was felt. There appears to have been choroiditis, for the vitreous contained flocculi. With re-establishment of the menses recovery of vision took place, only some slight synechiæ posteriores being left. In M. Leval's case recurrent attacks of serous iritis occurred with each return of the menses, which had been suppressed by a violent mental shock. Improvement resulted from treatment. In Kay's case the menses were irregular, and an attack of serous iritis accompanied their return. In this instance appropriate treatment effected a cure. In one of M. Oursel's cases the patient, aged nineteen, was very irregular, and both eyes were affected; a glaucomatous attack supervened. The patient declined operative treatment. In another case of Oursel's double iritis supervened upon a menstrual period, synechiæ formed, and the case was complicated with keratitis and hæmorrhage into the anterior chamber. Wecker, Caudron, and others have

* 'Thèse de Paris.'

† 'Archiv f. Aug.,' Aug. 8th, 1881.

‡ Thaon, 'Thèse de Paris.' Oursel, 'Thèse de Paris,' 1878. Kay, 'American Journal of Med. Sciences.' Leval, 'Thèse de Paris,' 1885, p. 30.

reported cases of double irido-choroiditis, which certainly followed, and apparently resulted from sudden suppression of the menses.

Retinal apoplexy consequent on sudden suppression of the menses has been described by several writers. Thus, Léon Oursel* gives the case of a previously healthy woman who, while menstruating, was caught in a violent shower of rain. Sudden arrest of the function occurred, followed by rigors, headache, and vomiting. Two days afterwards she discovered suddenly that the vision of the right eye was almost lost. Ophthalmoscopic examination showed that there was a large retinal hæmorrhage covering the macula lutea. In this case almost complete recovery, with only a faint central scotoma, resulted. A similar case is recorded by Danthon.

I saw, with Dr Gill, a young lady twenty-two years of age, who two years previously had swum out of her depth at Margate. She gained the shore greatly exhausted, and the same night had an epileptic fit, and subsequently others at intervals of a month or more, but these were without effect upon her eyes. Shortly before I saw her she had been rowing up the Thames, and fell into the water at Windsor Lock. She was menstruating at the time, and the sudden immersion stopped the process, and she became amenorrhœic. Within a few weeks keratitis, partly interstitial and partly superficial, attacked both corneæ. The inflammation was not accompanied by pain. Her vision was reduced to $\frac{6}{18}$ with the right eye and $\frac{6}{24}$ with the left. The discs could not be clearly seen. The possible origin of the disease from the reflex action of the teeth, of worms, and of constipation were one by one excluded. About a week after she was first seen pain began to be felt, which gradually became very severe, and the inflammation extended from the cornea to the iris and choroid, so that she suffering from keratitis and from irido-choroiditis. Vision was reduced to perception of light. Dr. Gill had ordered citrate and iodide of potash,

* 'Thèse,' p. 63.

without improvement. Leeches and Hydrarg. c. Creta with quinine were prescribed and, cold applications proving most agreeable, cold compresses were kept constantly applied. In the course of a few days the mercury was exchanged for bromide of potassium. Improvement gradually took place. The catamenia became regular, and early in December the corneæ began to clear, and by July in the following year she could read No. 1 Jaeger with the right eye. I saw her one year later, and she could then read $\frac{6}{6}$ with the right eye and $\frac{6}{12}$ with the left. A small spot of retino-choroiditis was visible near the fovea centralis of the left eye.

Retinitis may occur as the result of sudden suppression of the menses. M. Thaon records a well-marked case in which the connexion between the inflammation of the retina and the menstrual disturbance was well marked in a girl of twenty, of previously good health and regular, who was suddenly amenorrhœic in consequence of mental excitement and family troubles. On the third day after the emotion violent headache was experienced. She had rigors, and on the seventh day the vision of the left eye was seriously impaired. The symptoms of optic neuritis were slightly marked, but at the distance of three diameters from the disc were numerous white patches along and superjacent to the vessels, with some large muscæ in the vitreous. Vision was abolished in the upper third of the field. Treatment directed to the restoration of the menses was followed in this case by great improvement, if not perfect recovery. Other cases will be found in the Journals and Reports, in which retinitis occurred sometimes with and sometimes without hæmorrhage.

Paresis of both the internal and external muscles of the eye has been noted. Hasner has reported one case of a girl aged seventeen, who, each month when the catamenia were present, was attacked with complete paralysis of the whole of the left third nerve, which lasted for three days, and was accompanied by headache and vomiting. The affection had persisted for four years, with great regularity

in its recurrence. I suppose that we have all met with slight affections of the third nerve, in the form of accommodative asthenopia, dilatation of one pupil, and diplopia clearly attributable to the enfeeblement and general exhaustion of the system, which accompanies the menstrual discharge, and which of course brings any hypermetropic defect into prominent notice.

I have a strong impression that menstrual disorders constitute a factor in the development of the obscure affection termed conical cornea, or perhaps there may be some cause common both to the derangement of the menstrual function and to the thinning and yielding of the cornea. I have seen three or four women, in all of whom the catamenia were scanty, the complexion pale, the expression of the face dull, and the general aspect poor and ailing. I have, however, been unable to recognise any special organ as diseased. The cases I have seen have been of the ages between twenty-eight and thirty-four or thirty-five.

One of the functional disturbances of vision that may be met with associated with amenorrhœa or with dysmenorrhœa is amaurosis, of which a typical case was reported by M. Dor to the Congress of Ophthalmology, 1884. The blindness lasted for twelve days in the right eye, and for six weeks in the left eye. There was hemianæsthesia affecting the left side of the body. With the return of the suppressed menses the symptoms cleared away, leaving the patient with perfect vision.

Some years ago I saw a patient sent to me by Dr. C. P. Tomkins, of Beddington, who had long suffered from severe dysmenorrhœa. She had been a governess, and had always been delicate, hysterical, and subject to most severe attacks of neuralgia at her periods. I need not give her symptoms in detail, but she had suffered from ovaritis, had lost her voice, had had herpes, and her pulse had been 50. She complained of great impairment of vision due to a close black network, which was constantly before her eyes, and a central scotoma of the form of a hand. I raised her lids with difficulty, for she kept her head

down, and light was distressing to her, and after some trouble obtained a sufficiently good ophthalmoscopic examination to assure myself that the media were clear, that the discs were whiter than natural and slightly cupped. The symptoms in this case were, I imagine, essentially reflex, and connected with the dysmenorrhœa.

Partial atrophy of the papilla may now and then occur. Galezowski* reports a case which, however, I should have been disposed to attribute to hæmorrhage, for in the year preceding she had had a miscarriage attended with much loss of blood. The symptoms were: Derangement of the catamenia, with headache, vertigo, and sudden failure of the vision of the left eye. Return of the menses, accompanied with much hæmorrhage, was followed by a similar attack in the right eye, and a condition of hysteria was established. No improvement took place after treatment, and the optic disc presented a condition of atrophy chiefly affecting the external segment.

The precise mode in which disturbance of the menstrual function operates in inducing ophthalmic disease is obscure. It may be by retaining in the blood, in cases of sudden suppression of the menses and in cases of amenorrhœa more slowly induced, materials that are of a poisonous nature, the action of which is indicated by the loss of blood-making power, and consequent imperfect performance of other functions, with spasms and pain in different regions of the body, in which the eye participates; or it may be by acting on the vessels of the eye alone through the nervous system in a reflex manner, and thus interfering with its due nutrition, as we know may occur in cases of dental disease and the intestinal irritation of worms.

It need hardly be said that the treatment of such cases falls into the hands of the obstetric physican in most instances, and our part is limited to the recognition of the nature of the ophthalmic trouble and to giving a forecast of the probability of improvement or complete restora-

* 'Recueil,' 1882, p. 36.

tion of sight. In cases of the deep-seated affections of the choroid and retina much caution should be exercised: first, because it is not possible, owing to the cloudiness of the media, to recognise the exact extent of the mischief; and, secondly because the history of such cases shows that even when no very serious lesion is visible under the ophthalmoscope vision may long remain impaired.

The occurrence of a reflex action between the ovary and the eye, though in itself highly probable, is difficult to establish, because there are so many contingencies, and the path through which the noxious influence travels is difficult to trace. The following case is, however, one in which I thought that such a connexion existed.

A young lady, married but childless, applied to me stating that she had experienced considerable pain over the right brow, and that dimness of the right eye had at first annoyed, and as it increased in intensity alarmed her, and that she had just discovered she was blind with this eye. On examination, I found the right pupil slightly dilated, very sluggish in response to light, and vision reduced to mere perception of light. There was slight eversion of the right eye. The left eye was normal, pupil acting well, and vision $\frac{6}{6}$. On ophthalmoscopic examination the disc of the right eye was found to be swollen and reddish, with ill-defined margins—in short, with the general aspect of optic neuritis. She informed me that about nine months previously she had suffered from an attack of ovariïtis, for which active treatment was adopted, and she was confined to her room for some time. Having been married for a year or two without family, and thinking there might be some mechanical obstacle, she placed herself under the care of a distinguished gynæcologist, who passed a sound into the uterus, causing considerable pain, about two months previously. I prescribed iodide of potassium for her, directed her to rest at home, and gave general directions for her diet. During the next succeeding few days she complained of a feeling of coldness and numbness of both

sides of her body. Improvement in vision took place almost immediately after commencing the use of the iodide, and in less than a week she was able to count the fingers, and to see large objects on the temporal side of the right eye. The urine was loaded with lithates. A consultation was held, and it was agreed to rub in mercury till the gums were touched; 1300 grains were required for this purpose, about half a drachm being rubbed in night and morning; steady improvement took place, the field of vision gradually extending till it became nearly normal. She herself called attention to the circumstance that within a small area—about fifteen degrees to the outer side of the point of fixation—pink objects appeared green. This area corresponded nearly to the region of the optic disc, but she was very positive about its occurrence. About four months afterwards, strychnine and iron having been taken with intermissions in the interval, she stated that she was perfectly well, and could see almost as well with the right as with the left eye, though it was slower of perception, so that she had to look for an appreciable time before the words became visible. The pupil had recovered its natural activity.

At first sight this case appeared to be one of hysteria, and in the pre-ophthalmoscopic period would undoubtedly have been diagnosed as hysteria. Dr. Hughlings Jackson, who saw the case with me, was quite satisfied of the existence of the neuritis. The family history was good. It seems to me that one of two suppositions is open to us: either that some coarse disease of the brain was in progress, which is to some extent negatived by the great improvement that has taken place; or that, as I believe, there was some reflex irritation proceeding from the old ovariitis, perhaps lighted up by the passage of the sound.

In similar hysterical cases, where great disturbance of vision accompanied with great pain have occurred, iridectomy has been resorted to in the hope of affording relief. A case of this nature has been recorded by Cuignet.[1]

[1] 'Rec: d'Ophthal. Ann.,' 1876, p. 17.

This case was remarkable for the fluctuations it presented, the patient, whose vision was at first almost abolished, being able to see with a smoked glass, then requiring a + 2 D, then a concave glass, the ultimate result being complete loss of vision in the eye affected.

It is not surprising that the profound changes effected in the female organism by the supervention of pregnancy should betray themselves by some alteration in the structure and functions of the numerous and complicated tissues of the eye. Physiological researches have shown that at this period there is considerable increase in the absolute volume of the blood, the development of the wide sinuses of the uterus requiring so large a quantity of blood to fill them that a state of anæmia in other organs would otherwise occur, as indeed is sometimes seen when this part of the process is imperfectly performed. At the same time the quality of the blood undergoes considerable alteration, which, though it may fit it for the retention ofthe fœtus, is certain to exert a marked influence on other organs and tissues. The most remarkable of these changes is that the red corpuscles and the albumen diminish, whilst the water, white corpuscles, and fibrin increase. Hence the specific gravity of the blood, as a whole, is diminished, and there is a deficiency in the solid constituents of the serum, probably owing to their being taken up by the fœtus. The increase of the fibrin and of the white corpuscles may perhaps be explained by the growth and development of the lymphatic system of the uterus and of the glands of the uterus, occasioning what has been termed by Virchow a physiological leucocytosis. In accordance with this condition of general plethora of the vascular system with thinner blood, the heart, having to drive a greater volume of fluid through a larger area, undergoes an hypertrophy of the left ventricle; and to the combined conditions of diluted blood, wider vascular area, and a more powerfully beating heart, some, at least, of the more common symptoms of pregnancy are due—as, for example, palpitation, tendency to syncope, and nervous

irritability; numerous phenomena on the side of the digestive apparatus—as dyspepsia, anorexia, and morning sickness; and, lastly, various modifications of the urinary function, the urine being usually increased in quantity, and being found in a large percentage of cases to contain albumen It is, indeed, stated that albumen appears in the later months of pregnancy in 20 per cent., and in a still larger proportion of primiparæ.

One of the subjective defects of vision that is first and very commonly observed by the patient in pregnancy is loss of the power of accommodation. She finds herself unable to read or work for more than a few minutes; letters and lines run together; pain in the eye or brow, sometimes of an acute character, is felt, and the book is laid down, not to be again taken up. This symptom, due to imperfect nutrition of the ciliary muscle and of the third nerve, probably depends on the watery state of the blood, and belongs to the same category as the vertigo and fainting that are occasionally in pregnant women, though it may be of a reflex nature, and comparable with the amblyopia seen in cases of dental disease. The earliest period at which I have met with it has been at the eighth week, and in this case it occurred in a patient whose refraction was normal; but it is most common in the later months. It is to be relieved in two ways: first by attention to the general health, the administration of tonics, the regulation of the bowels, and systematic, if brief, out-door exercise; and secondly, by the temporary employment of weak convex glasses. The symptom is earliest and most strongly felt by the hypermetropic patient, and the strength of the glass must of course be proportionate to the degree of hypermetropia present.

Again, the great lassitude and debility which affect many women, the result of the disturbance of the digestive organs, renders them peculiarly susceptible to the influence of cold. I saw a woman, thirty-two years of age, who came to me with intense congestion of the conjunctivæ, which she stated had recurred after exposure to cold with

each of her five previous pregnancies near the time of her confinement, and other authors have noticed that liability to attacks of conjunctivitis characterise this period.

In all instances where the nutrition of the body is badly maintained, either from an inadequate supply of food or from imperfect digestion and assimilation so that the blood becomes thin and poor, those parts of the body which are most remote from the blood supply are apt to suffer. The cornea is one of these parts, and we accordingly find that ulcers of the cornea sometimes occur in pregnancy. Whether the ulcer results from simple disintegration and decadence of the superficial epithelial layers of the cornea, or whether these cells, being imperfectly developed and preserved, yield to external influences—such as the attacks of micro-organisms, which under ordinary circumstances they are capable of resisting—it is difficult to say. Perhaps both conditions coexist, and lead simultaneously to the formation of the ulcer. I believe that pregnancy is a predisposing cause to lacrymal abscess, the morning sickness, by inducing congestion of the head, putting a finishing touch to a nearly closed nasal duct, and effecting its complete occlusion.

Amongst the functional disturbances that are apt to accompany both dysmenorrhœa and the process of pregnancy is the condition formerly named *hebetudo visus*, in which there is heaviness of the lids almost amounting to ptosis, inability to face light, and indisposition to exert the power of accommodation by attention to any kind of near work. In many instances, no doubt, these effects are due to failure of the power of accommodation in a hypermetropic eye ; but, as Förster remarks, a certain number of cases remain, where this complication is excluded, in which the failure of power is due to a reflex hyperæsthesia of the fifth nerve and of the optic nerve, and constitute an aggregate of symptoms to which the the term " kopiopia hysterica " may be applied. Förster devotes quite a long chapter to this subject. He points out that the hyperæsthesia of the fifth nerve leads the

patients to use exaggerated terms in describing their ailments, and causes them to continue to complain of pain and discomfort even when any slight defect of hypermetropia or presbyopia has been corrected. The glasses increase the pain, or the frames are too heavy, or they see too acutely and clearly with them. The implication of the optic nerves is indicated by the patients complaining of light, and especially of artificial light, which, they state, irritates their eyes much more than the diffused yet more brilliant light of day. During the day such patients can walk out without inconvenience, but with the entrance of the lamps they insist that it is essential to their comfort that they should have darkened glasses. Förster believes this peculiar form of intolerance of light, which is characterised by the absence of any well-marked tendency to lacrymation, is due to intolerance of differences of illumination of objects in the field of vision, which is much more noticeable by artificial than by natural light.

That the congestion of the head which results from the severe retching and vomiting that so often accompanies the early months of pregnancy may induce hæmorrhage upon the retina, the following case, of which a drawing was taken by Miss Boole, will show. The patient was twenty-nine years of age; had married at nineteen, and had had five children, four of whom were living. Her eyes had been perfectly healthy up to five weeks previously, when, after a violent effort of retching in the evening, her eyes felt dazzling and every object was wavy. The next morning, on rising, she discovered that she could only see objects above the horizontal plane, and this defect was permanent. Ophthalmoscopic examination revealed the large hæmorrhage, with rounded contours, close to the disc and to its outer side, shown in the drawing (Plate I). The patient was examined by Dr. Godson, who pronounced her in the sixth month of pregnancy. The urine was carefully tested by Dr Bullar, and contained neither sugar nor albumen.

DESCRIPTION OF PLATE I.

Illustrating Mr. Power's 'Bowman Lecture.' From a drawng by Miss Boole.

Retinal hæmorrhage at the sixth month of pregnancy occurring immediately after severe retching, causing serious and permanent impairment of vision.

M. Boole del.

Danielsson & Co, lith.

Puzzling cases occur every now and then in the early months of pregnancy, which, however, point to embolism as the cause of the symptoms. For example, a patient aged twenty-eight, in the third month of pregnancy, suddenly noticed that vision was lost below a line running obliquely from the temple to the nose in the right eye. The most careful examination by more than one ophthalmic surgeon of repute failed to discover the slightest defect or disease in the eye. She had had severe headaches, and also some choreic movements of the facial muscles and of the arm of the right side, three weeks previously. The urine was perfectly free from either albumen or sugar. It was remarkable that pressure on the globe gave distinct phosphenes on the non-sensitive part of the retina. Six or seven years have elapsed, and the only change noticeable is that the disc on the right side is whiter than on the left.

In the later months of pregnancy another affection is sometimes observed, which has been frequently described, is of a serious character, and is deserving of special attention both on account of its value as an indication of the condition of the patient and for the special treatment that it suggests. It is a condition that very closely resembles, and is perhaps identical with, albuminuric retinitis. The patient does not usually complain of impairment of vision until well-marked retinal changes are visible on ophthalmoscopic examination. These changes consist in swelling of the optic disc, rosiness of its surface, indistinctness and blurring of its margin, enlarged and increased tortuosity of the retinal vessels, their point of emergence from the disc being concealed by effusion, hæmorrhages of large and irregular form, and white patches, which are sometimes irregularly scattered over the surface of the retina, and sometimes arranged in a radial manner around the yellow spot. The onset of the disease is often sudden, and accompanied by headache, flashes of light, and other symptoms of retinal irritation. Vision may be reduced to perception of light only, or to

the power of counting the fingers. These symptoms are associated with the appearance and continued presence of albumen in the urine, and this condition has been described by gynæcologists as gravidic albuminuria.

It is often a precursor of convulsions. The phenomena of uræmic eclampsia with ophthalmic symptoms were first brought under the notice of the profession in England by Dr. Matthews Duncan, in a translation made in 1857 of Braun's memoir on the subject. In accordance with the received pathology of that day, the symptoms were attributed to the presence and decomposition of urea in the blood; and in giving a graphic description of the symptoms of the attack, Braun remarks that it is sometimes preceded by mental illusions, photopsiæ, and amblyopia, and that it may terminate in complete blindness.

The conditions which may lead to the appearance of albumen in the urine are very various. Dumas* arranges them under three heads—viz. increase of intravascular tension, qualitative alteration of the blood, and temporary or permanent disease of the kidney. Others have suggested that there may be in some cases catarrh of the lower part of the neck of the uterus, and it is quite possible that two or more of these causes may co-operate in producing the symptom. The great derangement of the processes of digestion that occurs in pregnancy lends a high degree of probability to the view that changes in the composition of the blood, consequent on the absorption of imperfectly digested proteids, exert a powerful influence in inducing albuminuria, whilst the fact that it is particularly common in twin pregnancies lends support to the idea that pressure on the renal veins and local disturbances of the circulation may play their part in its production.

The appearance of albumen in the urine in pregnancy is most common about the eighth or ninth month; but it has been seen by Ollivier in the third month, and by Bach as early as the sixth week. The duration of the attack,

* 'Thèse,' 1880.

according to Hofmeier, is usually five or six weeks. Gravidic albuminuria usually rapidly disappears after delivery. The ophthalmic trouble also usually commences in the later months of pregnancy, though Rayerson* reports a case in which it occurred in the fourth month. If pregnancy proceeds, the ophthalmic affection becomes more marked and manifest till delivery takes place, before which period no improvement can be expected to occur.

The history of all these cases is similar. I give one that I saw with Mr. Ambler, of Hempstead House, Hemel Hempstead. The patient was a young woman aged twenty-seven, and applied to Mr. Ambler in the third month of her pregnancy, complaining of vomiting and great pain in her head chiefly confined to the occipital region, constipation, and swelling of the legs and ankles. The urine, on being tested, was found to contain one sixth albumen. Mr. Ambler prescribed hot baths, diuretics, and tonics, and compound jalap powder every other morning. The patient became steadily worse, and her friends were told she had little chance of going her full time. She suffered much from sleeplessness, for which chloral hydrate and digitalis were given to her. Albuminuric retinitis commenced about the sixth month of pregnancy. The constitutional symptoms became so severe about the seventh month that Mr. Ambler made up his mind to induce premature labour, and this was, with the consent and approval of Dr. Russell Steele, about to be done, when spontaneous premature delivery took place in January, 1885, and a still-born fœtus was expelled having the appearance of having been dead a week. She made a good recovery from the labour, and for some time subsequently Mr. Ambler prescribed perchloride of iron, and the vision underwent steady improvement. When I saw her three months after her delivery, the general aspect of the fundus was that of albuminuric retinitis in the right eye, that of the left being apparently normal. The disc was ill-defined, and there were numerous white spots arranged in a

* 'Galezowski's Recueil,' 1883, p. 623.

radiating direction around the yellow spot. Her vision was: R. $\frac{6}{18}$; L. $\frac{6}{6}$. She was ordered strychnia and iron. I saw her in July, six months after her confinement. Both discs were hazy; there was some amblyopia, but the area of the field was normal. There was defective colour vision: pinks were called white, bright browns were called slate, but saturated tints were immediately and correctly recognised. On October 6th, 1885, the spots, with one or two exceptions, had disappeared; the right disc was much whiter than natural, but its edges were blurred and indistinct.

Holmes* describes a case of retinitis with albuminuria and partial detachment of the retina occurring at the sixth month of pregnancy. There was complete loss of vision. At the end of three months vision returned after the employment for three weeks of the bichloride of mercury, but there remained complete loss of colour perception. At the expiration of three months more she recovered the power of perceiving colours, blue being first recognised, then in succession brown, red, and green.

That conditions of optic neuritis with exudation on the retina may clear up in a very remarkable manner is well known, but it is not often that an opportunity is afforded of carefully comparing the earlier with the later conditions in drawings made by a competent artist. I desire to show to the Society the two drawings taken by Miss Boole of a patient who came to me complaining of great impairment of vision in the seventh month of pregnancy. It will be seen that in the first the appearances are those of gravidic albuminuria in its highest and most intense expression. The swollen, congested and ill-defined disc, the dilated and tortuous vessels, the hæmorrhages, and the white plaques, are all shown to perfection. Vision was then reduced to little more than mere perception of light. The quantity of albumen amounted to about one sixth. An abortion occurred, and delivery was safely effected. And here is the other drawing by the same

* 'Archiv f. Augenheilk.,' xii, i, p. 89.

DESCRIPTION OF PLATE II.

Illustrating Mr. Power's 'Bowman Lecture.' From drawings by Miss Boole.

Fig. 1.—The appearances presented by the left eye of Mrs. O'Dell, taken 25th November, 1881, in the seventh month of pregnancy. The contour of the disc can scarcely be distinguished. The arteries are tortuous, and in some parts of their course obscured by effusion. The veins are greatly distended, varicose, and also much obscured by effusion. There are a few flame-like hæmorrhages, and many irregular-shaped white patches.

Fig. 2.—The appearances presented by the same eye, 28th October, 1882, showing that the white patches, hæmorrhages, and optic neuritis had almost entirely disappeared, and that the veins had recovered their usual form.

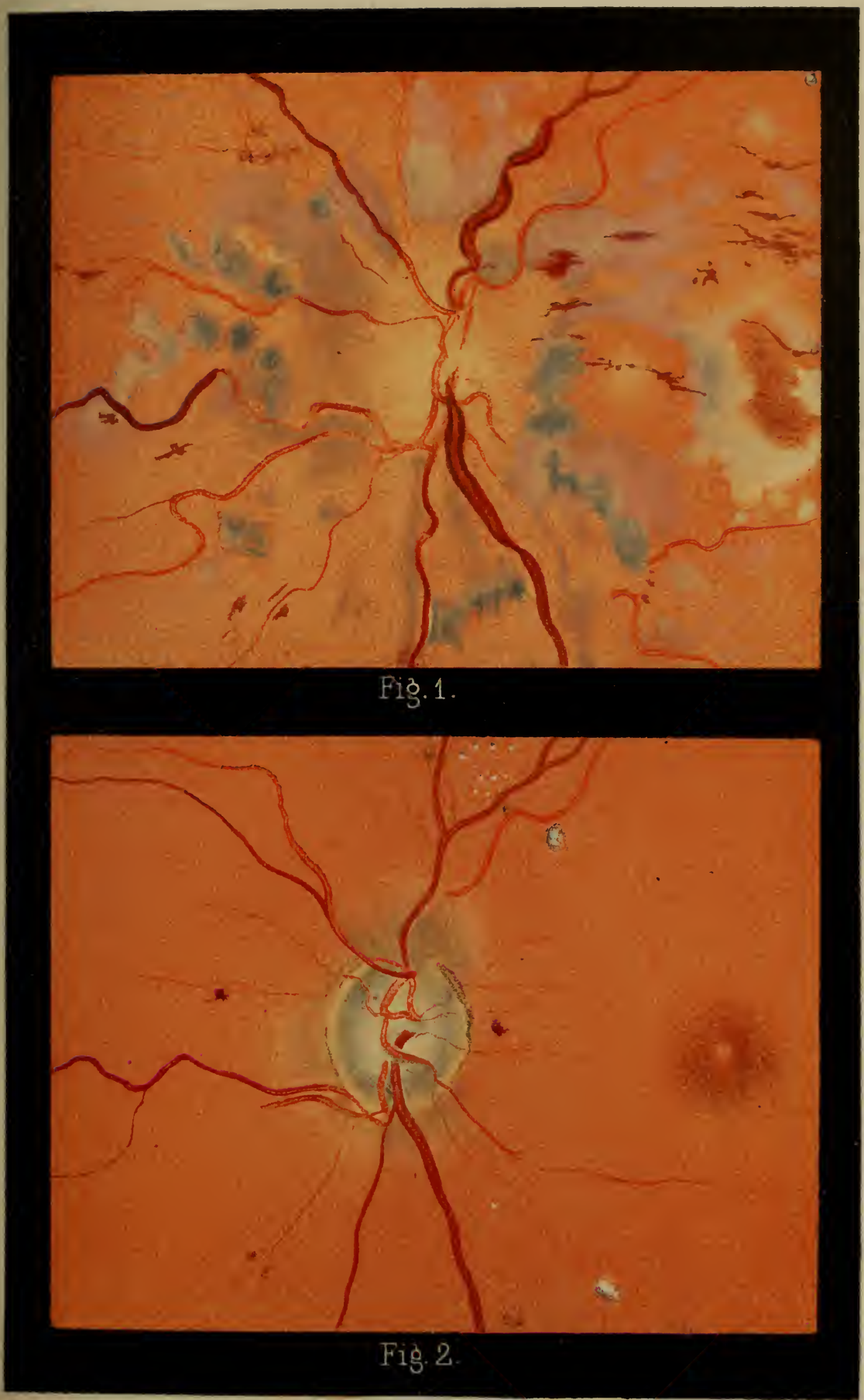

Fig. 1.

Fig. 2.

M. Boole. del.

Danielsson & Co. lith.

artist, in which but few traces of the former troubles are to be seen (Plate II, figs. 1 and 2).

No positive statement can be made as to the ultimate results of gravidic retinitis. I have seen a case of almost perfect blindness, and also one of almost complete recovery. In some instances, again, gradual and unexpected improvement will take place in one eye, whilst the vision of the other undergoes progressive deterioration. Thus, in one case that fell under my care, a woman, aged thirty-three, had been confined of her fourth child five weeks previously. All the children were living and healthy. Two months before her last confinement, which was protracted and difficult, requiring the use of instruments, her vision became impaired. The dimness affected both eyes, and increased till she was unable to see light with the right eye. Yet she had no pain in either eye. On examination it was found that the right eye was the better of the two, vision in this eye being $\frac{1}{9}$; whilst she was able to spell out 14 Jaeger with the left eye, she could only count fingers at one foot. The whole field of vision in the right eye was dull, but it extended to about 50° vertically, and to about 15° horizontally, being therefore a long oval placed vertically. Her perception of colours was pretty good. On ophthalmoscopical examination the media were found to be clear. Both discs were yellowish white, with well-defined margins and smooth level surface; no physiological pit. The retinal arteries and veins were of normal size. The choroid generally was apparently healthy. She still had considerable pain in her head.

Weber* observed cases which terminated in complete amaurosis; and Hirschberg has reported cases of albuminuria in which, although there were no ophthalmoscopic signs, complete blindness existed. The amaurosis, however, in his cases proved to be temporary only, the patients ultimately making a perfect recovery.

The conditions we are able by means of the ophthalmoscope to recognise in the interior of the eye thus

* 'Berlin. klin. Wochens.,' 1873, pp. 265—279.

furnish the obstetric physician with valuable suggestions for treatment. The existence of hæmorrhages and of white patches on the retina indicates that the normal relations between the blood, the blood-vessels, and the tissues are so modified that healthy nutrition can no longer be maintained, and that, unless speedy relief be afforded, the same or similar changes will occur in the brain, and convulsions, and perhaps death, be the result. The treatment which seems to be most promising is to promote in every way the general health of the patient; to support the abdomen with a bandage or belt, so that pressure on the kidneys, the ureters, and renal vessels may be relieved; to limit the work thrown upon the kidneys by attention to the diet and to the quantity of drink taken; to unload the bowels; and, finally, if the ophthalmic symptoms become still more marked, to induce premature labour.

Mr. Hutchinson has recorded a case which seems to point to the occurrence of exophthalmic goitre as a result of pregnancy. The development of the disease in this case occurred in the fifth month of pregnancy.*

I have only time briefly to refer to the ophthalmic symptoms that may be met with in the puerperal state. Occlusion of the vessels of the retina might be expected to occur at this period. Mr. Snell† has quite recently brought before this Society an interesting case of embolism of the arteria centralis retinæ of the left eye occurring two months after delivery in the course of a case of puerperal septicæmia. It was followed by white atrophy of the disc. The heart and lungs were normal, and there was neither albumen nor sugar in the urine. It was surmised, but there appears to have been no positive evidence, that the embolus proceeded from the heart. In such a case as this the mischief appears to be entirely limited to the central artery of the retina and the vascular area beyond the point of occlusion.

* 'Trans. Ophth. Soc.,' vol. vi, p. 32.

† Ibid., p. 341.

A form of disease occurring in puerperal women was long ago described by Hirschberg under the term "septic puerperal embolism," which is altogether a different thing from simple embolism of the central artery of the retina. It is certainly of rare occurrence, and Hirschberg* had only seen six cases of it. In such cases the lochia are usually abundant and offensive, and from a fortnight to three weeks after delivery rigors are experienced and pain is felt in one or in several of the joints, which suppurate. The eye presents the appearance of general ophthalmia, the conjunctiva being red and chemosed, the iris being inflamed, the anterior chamber containing pus, and vision becoming greatly deteriorated; gradually the cornea becomes hazy, the area of the pupil is filled with exudation, and vision is lost. The patient usually dies, and the fluid in the joints is found to contain bacteria, whilst the globe is undergoing suppuration, the retina and choroid being also infiltrated with pus.

Local and more or less complete paresis and paralysis of the ocular muscles are occasionally observed in the puerperal state. I have seen, for example, a case of mydriasis in a primipara of delicate and neurotic habit of body, who had been brought to bed two months previously of a child she was unable to nurse. The prime cause of the paralysis is not easy to give; it may be of a reflex nature, or be due to some local neuritis of the nerve supplying the muscle, or be the consequence of a hæmorrhage into the sheath of the affected nerve, or possibly to spasm of blood-vessels, or to embolism. Recovery is doubtful.

Various exceptional conditions may be met with. For example, I saw a case where towards the close of her time a woman complained of seeing all objects much smaller than they were naturally presented to her eyes; and I find that Churchill, Gardien,† and others have observed the same symptom. Churchill observes that the patient

* 'Archiv für Augenheilk.,' Band ix, p. 299.

† 'Diseases of Women,' 1874, p. 616.

may imagine all surrounding objects are dancing or turning round, or she may be so dizzy as to be incapable of distinct vision. These symptoms are probably connected with anæmia, or at least with disturbance of the circulation in the brain, and in general nothing can be seen with the ophthalmoscope. In other instances the patient has illusions and hallucinations, fancying that she sees objects in the air; or photopsiæ; more rarely she sees everything double.*

I have seen several cases in which there has been sudden loss of vision or loss of one half of the field of vision of one eye, without manifest ophthalmoscopic signs, though the fundus was carefully and repeatedly explored. In two of these cases which I have had the opportunity of following up, the attack was quite sudden. In one no notable change has taken place in the course of three or four years in the disc or retina. In the other, a few minute spots, supposed to be tubercular, have appeared on the surface of the retina. The cases were regarded as instances of embolism of arteries supplying a minute area of the corpora quadrigemina, or to some trouble of circulation in one optic nerve.

Several conditions of disease of the eyes are associated with lactation. In a healthy woman it is surprising how well this active and abundant secretion is borne. A more liberal diet, the constituents of which are digested and absorbed with wonderful rapidity, seems all that is necessary to enable from one to three pints of good milk to be secreted without exhaustion of the system, and this may extend over a period of from four or five to nine or ten months. There are, however, a large number of more feebly constituted women in whom the powers of the system seem to be exhausted with the effort to develop and extrude the fœtus, and in whom the mammæ fail to respond in their growth and functional activity to the cry of the child. Many women desiring to become good mothers attempt, but in vain, to give suck to their infants;

* 'Traité des Accouchements,' vol. ii, p. 76, 1824.

and if the attempt be continued, it is not uncommon to see one of several conditions arise. In the first place loss of accommodation occurs, which is the most common. Dizziness and temporary amblyopia, sometimes rising to amaurosis, have been seen and noted by many; both symptoms being clearly due to an insufficient supply of blood to the brain and eye. Black specks, showers of motes, and other photopsiæ are not uncommon. Paresis of one or other of the recti muscles may also occur.

Keratitis may also result from exhaustion dependent on prolonged lactation and pregnancy. I saw a woman of worn and pallid aspect who had one child four years of age, another two, and was in the third month of her pregnancy with a third. She suckled the second child thirteen months, and had always dysmenorrhœa when not pregnant. She had keratitis in her right eye, and the vision was reduced to $\frac{1}{100}$; the vision of the left was perfect. The centre of the cornea presented a rough surface caused by the separation of a patch of epithelium. She was ordered meat and quinine, and recovered.

I may also refer to the not infrequent cases of severe keratitis with hypopyon which are seen as the result of slight scratches of the cornea by the sharp and ragged nails of the infant, which show clearly the great depression of the system, the great relative increase of the white corpuscles, and how much even such dense tissues as the cornea have lost their cohesion and power of resistance to external injurious influences. A further evidence of the same fact is to be found in the predisposition occasioned by lactation to obstruction of the lacrymal ducts and to lacrymal abscess. Many women suffer from obstruction of the ducts of so slight and inoffensive a character that they never think of applying for relief; but when the system is weakened by lactation, either the mucous membrane of the nose or of the nasal duct becomes congested, and complete instead of incomplete obstruction is effected, or possibly the epithelial cells become, owing to their imperfect nutrition, less able

to resist the invasion of germs and microbes, and suppuration is established.

I have had one case of detachment of retina, which seemed to me to be directly connected with the exhaustion of the system caused by suckling. Mrs. B—, aged twenty-seven, came to me complaining of complete loss of vision of her left eye. It had begun to fail two months previously, of which she became aware by constantly seeing a cloud of black flies before her. She was a thin, pallid woman, and had just weaned a baby after suckling it for eleven months. Dr. Watts, of Charnbrook, had instilled a little atropine, and she could then see a little better for a time. The vision of the opposite eye was perfect. Tension of both eyes normal. On examination by means of the ophthalmoscope, it was clear that there was complete detachment of the retina, only a very small portion of the normal red choroid being visible at the lower part of the eye. In this instance a general tonic line of treatment was suggested, but no operative procedure was resorted to.

I have noticed a peculiar affection in women who after severe confinements have made a slow convalescence and have remained for some weeks in the recumbent posture. To beguile the time they have read or worked for many hours in the day, and by looking downward have maintained the inferior recti muscles in strong contraction. Convergent action being also required, the internal recti and the superior oblique muscles are brought into play. The result of this is that, when the patient once more resumes her ordinary duties she experiences pain in and around the eye, the slightest attempt to read causes discomfort, and she soon applies for relief. As a rule, no changes are visible in the eye on ophthalmoscopic examination. The fundus is healthy, and the retinal vessels and the optic disc perfectly natural. The pain experienced is probably of the nature of spasm, and is best relieved by prolonged rest from work and the use of prisms of 2° or more.

There can be little doubt, I think, that the critical age

of the menopause in woman has a powerful influence in the development of glaucoma. The age of forty-five to fifty-five is of great frequency in the history of that disease, and it is easy to understand how it may be induced by the more or less sudden arrest of the habitual discharge. Whatever our theory of the etiology of glaucoma may be, it is certain that it is attended with considerable congestion of the choroid and ciliary processes, and with a tendency to the effusion of lymph and the colouring matter of blood into the vitreous, which even in subacute cases may become so cloudy that the details of the fundus cannot be distinguished. In gouty patients the venous system is already distended, but so long as the menstrual discharge continues, the vascular fulness undergoes periodical relief and the disease remains in abeyance; as soon as cessation of the function occurs the whole mass of the blood is augmented, and a natural relief is sometimes afforded by diarrhœa, or by hæmorrhage from the nose and other means; but should any circumstance determine the blood to the head, severe headaches are experienced; and, if, further, a flow of blood to the eyes is induced by weeping, whilst the tone of the vaso-motor apparatus is depressed by grief and night-watching, which is often associated with constipation, then an attack of glaucoma is exceedingly likely to supervene, accompanied, in some instances, with intra-ocular hæmorrhage.

At the period of the cessation of the menses, and either directly or indirectly due to it, paresis or paralysis of various nerves and muscles may be observed. Amongst these may be mentioned impairment or loss of the power of accommodation, mydriasis, and strabismus. These conditions, if attended to early, and appropriately treated, are generally only transitory, but if neglected they may become permanent. I have seen several cases where peculiar rolling unsymmetrical movements of one eye occurred when the other was fixed on any object; the two eyes have sometimes been used indifferently, vision being good in both, whilst the other wandered. Women are apt at

this time to take but little exercise, to dread cold, and to pursue some perhaps not very prudent plan of treatment. A lady came to me lately who stated that, finding she was becoming stout, she determined to practise Bantingism, and in three months had lost many pounds in weight. The result was that she had become weak and nervous and had suddenly developed a well-marked convergent squint of one eye. Recovery soon took place on a return to her natural diet, with an allowance of wine and the administration of a little quinine and iron.

In conclusion, then, it may be said that in males the excessive excitement of the sexual organs in youth occasions various subjective symptoms in one or both of the eyes—as muscæ, photopsiæ, asthenopia, and loss of accommodation, together with blepharospasm, and at a later period possibly retinitis, retinal hæmorrhages, and white atrophy. That in young women, the epoch of the installation of menstruation may be attended with conjunctivitis, both phlyctenular and follicular, and ulcers of the cornea, with special disposition to the development of keratitis consequent on constitutional taint. That amenorrhœa, especially if suddenly induced, may be followed by hæmorrhage into the anterior chamber or into the vitreous, iritis, irido-choroiditis, optic neuritis, and white atrophy of the optic disc. That dysmenorrhœa may be accompanied by conjunctivitis, keratitis, episcleritis, as well as by inflammation of the uveal tract. That the menopause is often accompanied by effusions into the vitreous and by a disposition to glaucoma; by paresis or paralysis of the ocular muscles. That pregnancy is often attended in the early months with asthenopia, and towards the close with albuminuric retinitis and its consequences—hæmorrhages and white patches on the retina; and that if delivery is attended with copious hæmorrhage, loss or great impairment of vision, with white discs, may occur. That in the puerperal state we may meet with embolism, which is sometimes of a septic character, and may rapidly lead to loss of the eye. And, finally, that in lactation—if we

DESCRIPTION OF PLATE III.

Illustrating Mr. Power's 'Bowman Lecture.' From a drawing by Miss Boole.

The drawing shows the fundus of left eye of Grace W—, the patient described in the 'Transactions' of the Ophthalmological Society of Great Britain, vol. i, p. 137, after the opacities in the vitreous occasioned by the breaking up of the blood-clot behind the iris had broken up and diffused through the vitreous.

M. Boole, del

Danielsson & Co, lith.

may be allowed to include that process in the consideration of the sexual organs—we find asthenopia, great tendency to suppuration of the cornea on slight scratches, and lacrymal diseases to be of common occurrence.

And thus, gentlemen, I have endeavoured to trace with very imperfect knowledge some of the relations which exist between the sexual organs and the eye. I have omitted purposely reference to such affections as syphilis, which affect both organs and have an interest peculiarly their own; but I fear I have omitted a multitude of relations that may be familiar to others, and which I can only leave them to supply from their own practice. But I think the facts I have brought forward are sufficiently numerous to show that such a connexion really exists, and that no history of many forms of ophthalmic disease can be regarded as complete which does not include and take into due consideration the conditions of the generative organs.

REPORTS.

I. DISEASES OF EYELIDS.

1. *Recurrent swelling of the upper lids.*

By Robert W. Doyne.

F. G—, æt. 15, never remembers to have seen well at a distance; occasional swelling of the lids came on fourteen months ago, sometimes both, sometimes only one; lately it has occurred about once a month. Sometimes they are swollen out on a level with her brows, half closing her eyes. For the last six months she has had typical attacks of megrim, developed with glimmering cloud spreading gradually over both eyes, followed by headache over only one eye, and passing off in two hours with vomiting.

V. $\begin{cases} \text{R. } \frac{6}{24} - 1{\cdot}5 = \frac{6}{6}. \\ \text{L. } \frac{6}{36} - 1{\cdot}75 = \frac{6}{6}. \end{cases}$

Catamenia have never appeared. There is effusion into and slight swelling of both discs, the upper margins of which are lost to direct examination. There is a large oval, shifting reflex at some distance around the macula. For direct examination a − glass seems only necessary for examination of yellow-spot region. Colour vision is normal. Fields of vision not contracted.

(*Card specimen. November 10th,* 1887.)

Mr. Gunn was of opinion that some of these cases at least were of the nature of urticaria. He had recently

under his treatment a young woman subject to these recurrent attacks of palpebral œdema, in whose case each attack was ushered in by intolerable itching. The interval between the recurrences varied considerably, but last autumn she had had unusually frequent attacks while residing at Margate, where she had been eating shellfish. The patient herself thought that the attacks were influenced by the nature of her diet.

Dr. Collins.—Respecting the suggested connection between these cases of spontaneous œdema of lids and absent or arrested menstruation, he might say that he had a short while ago a case precisely similar in a boy aged fifteen. That fact was, at any rate, sufficient to dissociate such alleged causal connection.

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2. *Spontaneous, symmetrical, transient œdema of eyelids.*

By W. J. Collins, M.D.

(With Plate IV, fig. 1.)

Henry A—, æt. 7, was in good health (except infantile spinal paralysis of right leg) until two hours before he was brought to hospital, when his mother noticed rapid swelling of his eyelids amounting to complete closure. He was sitting quietly at the table when this happened. No other symptoms; no cough; no fits; no albumen in urine; no morbus cordis; no anasarca of limbs. No history of a previous attack.

The swelling had subsided a little when the accompanying photograph was taken. The skin was translucent, unchanged in colour, no extravasation. Vision good and fundi normal.

Rapid resolution occurred, and no return observed during the three or four weeks he attended hospital.

(*Card specimen. May 3rd,* 1888.)

DESCRIPTION OF PLATE IV.

Illustrating Dr. W. J. Collins's cases of Affections of the Eyelids. From photographs.

FIG. 1.—Case of Henry A—. Spontaneous symmetrical œdema of eyelids came on rapidly and passed off in a few hours. (*Vide* p. 42.)

FIG. 2.—Case of Louisa L—, æt. 21. Spurious partial ptosis of left side due to paresis of left frontalis muscle. (*Vide* p. 253.)

FIG. 3.—Case of Alice Maria L—, æt. 23, with partial ptosis of right side. Overaction of the right frontalis muscle well shown. The ptosis was first transient and recurrent, and apparently hysterical, later on it became complete, actual, and persistent. (*Vide* p. 252.)

FIG. 4.—The same patient after removal of semilunar slip of skin from above right upper lid. There is still overaction of the frontalis, and on both sides.

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

From Photographs.

Danielsson & Co., Photo Print.

3. *Chancre or tertiary syphilitic ulcer of lower lid.*

By W. J. Collins, M.D.

E. C—, æt. 36, a sailor, from Harwich. History of a primary sore followed by rash fifteen years ago. For last three months has noticed an extending sore on right lower eyelid; knows no cause for it. It is painless. There are no enlarged glands. There is a crescentic ulcer with concavity upwards, extending along the outer two-thirds of the tarsal margin of the right lower lid, leaving an islet of skin between its horns. The surface of the ulcer is greyish, and yields a very scanty discharge. The adjacent skin is tumid, livid, and somewhat indurated. The margin of the ulcer is sharply cut. The tongue exhibits white plaques on the dorsum, suspiciously syphilitic. He was ordered mercury but he did not return to show the result. The appearance of the ulcer and neighbouring skin was strongly suggestive of a chancre; the history, absence of glandular enlargement, the evidence of previous syphilitic infection in the tongue, pointed to the possibility of its being a tertiary syphilitic ulcer, while the age of the patient, the surface of ulcer, and the appearance of the surrounding skin negatived the likelihood of its malignancy.

(*Card specimen. May 3rd*, 1888.)

II. DISEASES AND TUMOURS OF ORBIT.

1. *Large exostosis of orbit associated with intracranial tumour.*

By A. Emrys-Jones, M.D., Manchester, and
Peter Yates, M.D.

J. T—, æt. 26, a brass turner by trade, was admitted to the ophthalmic ward of the Bolton Infirmary on January 28th, 1888, suffering from proptosis of the left eyeball.

The following history was adduced: The patient has always enjoyed good health until about seven years ago, when while "larking" in the workshop he fell, striking his left eyebrow against the edge of a metal table. The immediate results of this blow were not of a serious nature, and very little notice was taken of it at the time. Shortly after receiving the blow, however, he noticed a small hard swelling at the upper and inner angle of the left orbital ridge, and this gradually increased. He consulted various medical men about it and was treated locally and constitutionally with iodine, and subsequently attended the Manchester Royal Eye Hospital as an out-patient. He was told that it was an "exostosis." During the twelve months previous to admission the growth has increased more rapidly and the displacement of the left eyeball has become much more marked.

Up to four years ago there were no cerebral symptoms whatever, but at this time he was seized quite suddenly with a slight epileptiform fit which lasted about a minute and passed off rapidly. As far as could be ascertained

there were no convulsive movements of the limbs, no characteristic cry, but the tongue was bitten. Subsequently these attacks are said to have recurred monthly with remarkable regularity, and nearly always between midnight and 1 or 2 a.m. Until quite recently there were never any premonitory symptoms, and then only a slight "mazy" feeling before the onset of each attack.

The symptoms, as far as can be gathered, remained much the same up to within fifteen weeks before admission, when he had a rapid succession of fits, extending over a period of eighteen hours, followed by a noisy delirium. A local medical man was called in and prescribed some pills which produced sleep for a period of forty-eight hours. Since this time, that is to say, for fifteen months, he has had no recurrence of the fits, and has felt quite well.

He has never been troubled with pain in the head, vomiting, or loss of power or sensation. The vision in the left eye has not been materially affected, nor has he ever had pain in it.

The family history was good and there was no history of syphilis.

State on admission.—The patient is a strong, healthy-looking man; but one's attention is immediately drawn to the left eye, which is abnormally displaced downwards and outwards on the left cheek, the upper eyelid being very prominent. On closer examination, a distinct hard tumour could be felt under the upper eyelid, which was at first thought to be slightly movable. The eyeball itself was almost entirely extruded from the left orbital cavity. Vision in both eyes was fairly good. R. = $\frac{6}{6}$ and L. $\frac{6}{12}$; the ophthalmoscope revealed no changes. The patient was extremely anxious that something should be done, and begged to have the growth removed.

On the 31st of January, 1888, chloroform having been administered, an incision through the tissues of the upper eyelid was made a little below the left eyebrow, and the

exostosis exposed. An endeavour was then made to remove the growth *en masse* by means of chisels and gouges, but owing to the density and hardness it was found only possible to chip off fragments. After as much as possible had been removed, the wound was syringed out with a solution of carbolic acid, and the edges of the wound brought together by means of three or four catgut sutures.

Everything went on well until the morning of the 4th of February, when his temperature suddenly went up to 104° F., accompanied by great pain and vomiting. Two days previous to this, slight suppuration had been noticed at the inner corner of the wound, and one of the sutures was removed to give free vent to it; but on the occurrence of the elevation of temperature, &c., on the 4th of February the suppuration rapidly increased. All stitches were removed, and the wound was frequently syringed out with weak solutions of carbolic acid and boracic acid. Hot fomentations were also constantly applied. On the morning of February 5th temperature was 102° F., there was less pain, but the patient had passed a very restless night, accompanied with slight delirium. A blister was now applied to the nape of the neck. The patient gradually got more restless and delirious, and in the afternoon of the 6th of February became quite unconscious. There was considerable œdema of eyelids and conjunctiva. He gradually got worse, and occasionally there were slight convulsive movements of both upper extremities. He became comatose, and died at 1 a.m. on February 7th; the temperature rose to 107° before death.

Necropsy.—On reflecting the integuments a few drops of thick grumous pus welled up from the neighbourhood of the operation wound, and a great thickening of the left orbital ridge was noticed, with nodules of new bone protruding through the external table, part of this forming the base of the portion removed by operation, and farther back in the orbit was a nodule the size of a large walnut with a very irregular surface.

On sawing through the calvaria the saw passed through and cut off an internal growth, continuous with that in the orbit, occupying the whole thickness of the skull, and encroaching for an inch on the cranial cavity. This intracranial portion was more irregular and slightly larger than the orbital growth, and the two together, forming one continuous mass, measured antero-posteriorly two inches, and transversely two and a half inches.

The left frontal sinus was completely filled and occupied by the growth, a mammillated process extending for half an inch beyond the middle line.

Both tables of the frontal bone are very much thinned out by pressure, and in places completely eroded, this being especially well marked as regards the internal table.

Occupying the interstices and crevices of this irregular growth was a glairy mucoid substance, which when subjected to microscopical analysis, was found to be composed of large round and granular cells, very much like ordinary pus-cells, but about three times the size.

The dura mater was considerably thickened at the vertex, and strongly adherent to the bone.

After the removal of the membranes, a distinct depression was observed in the left anterior lobe of the brain, caused by the pressure of the bony growth, and in the brain substance below this, not at first noticed on account of the closing of the convolutions round the pedicle, was a soft yellowish, gelatinous, and slightly lobulated and encapsuled growth, springing apparently from the inner surface of the dura mater over the most prominent part of the exostosis. This was easily shelled out, and the cavity in which it was lying communicated posteriorly by a large opening with the lateral ventricle. The tumour when removed and placed on the table measured $1\frac{3}{4}$ inches by $1\frac{1}{2}$ inches by $\frac{3}{4}$ inch. Attached to its pedicle was a similar but much smaller secondary growth about the size of a horse bean.

In both the lateral and fourth ventricles some thick

greenish pus was found, and some organising lymph was noticed on the choroid plexus in the posterior cornu of the left ventricle.

On making a section of the intracranial growth a distinct but thin capsule was observed enclosing a mucoid material, the central portion being almost entirely colloid in character. There were numerous blood-vessels to be seen coursing across the tumour. On hardening the tumour in picric acid and spirit, and making sections of it, it was found that there was a distinct capsule, and running in from the capsule were a number of trabeculæ, which freely interlaced and formed a delicate network. In the interspaces of these trabeculæ were found a great number of large nucleated round cells, with here and there sparsely distributed myxomatous cells. A few irregularly shaped and colourless crystals were also observed embedded in the substance of the tumour.

Remarks.—On reviewing the literature of the subject of ex- and endostoses affecting the orbit, we find very few recorded cases, and in no recorded case is there mention of the occurrence of an intracranial growth together with an exostosis. In the 'Royal London Ophthalmic Hospital Reports,' vol. x, Pt. 3, August, 1882, Mr. Tweedy records a somewhat similar case with death after operation from septic meningitis, where a large ivory exostosis was chipped off the orbital plate of the size of half a large walnut.

At the necropsy it was found that the larger and unremoved portion of the growth occupied the anterior cranial fossa, pressing on the brain substance causing softening.

In the 'Ophthalmic Review,' vol. vi, 1887, p. 341, Karl Grossmann describes the successful removal of a large roundish exostosis of orbit, by means of repeated drillings through the base of the tumour.

In the 'Ophthalmic Review,' vol. vi, 1887, p. 344, there is an account by Mr. J. H. Andrews of the removal of two osteomata from the orbit, one frontal the other

ethmoidal, together with discussion on the pathological anatomy of such growths, the symptoms they give rise to, and the prognosis and the treatment.

In the same paper Mr. Andrews gives us some interesting statistics regarding osteomata of the orbit. Bornhaupt collected eleven cases of osteoma of frontal sinus which were operated on ; seven died of meningitis (63 per cent.), two recovered, and in two cases result was unknown.

Berger and Tryman collected nine cases, and 66 per cent. died after operation.

Bertin states that 38 per cent. of cases of orbital osteoma operated on died.

Mackenzie collected eight cases of orbital osteomata in which various means were adopted for their removal. Three of the cases recovered after removal by means of the chisel and saw. Four others, although attacked by caustics, trephines, and saws, resisted all endeavours at removal, and eventually exfoliated. In one case, after determined efforts by saws, forceps, &c., no benefit was derived, and the growth remained just the same two years after.

In none of the above cases, however, is there mention of the occurrence of an intracranial soft growth, together with an osteoma of the orbit, and as such the present case is unique.

The most noteworthy points in connection with the case are the following :

1. The almost total absence of cerebral symptoms during life, showing how the brain can accommodate itself in the cranium to intracranial growths without any great interference with its functions. No localised cerebral pain, no vomiting, and no paralysis.

2. Although the eyeball was greatly displaced, and presumably the optic nerve considerably stretched, the vision was not materially affected.

3. The impossibility of judging from external appearances the size of the orbital growth, and of diagnosing the existence concurrently of an intracranial growth.

4, and lastly. Is there any connection between the osseous growth of the orbit and the intracranial myxomatous growth embedded in the brain substance of the anterior lobe, or is the occurrence of the two growths purely accidental, and to be looked upon as a mere coincidence?

This case was under the care of Dr. Emrys-Jones at the Bolton Infirmary, the after-treatment and necropsy were entirely in the hands of Dr. Yates, the Senior House Surgeon.

(*June* 14*th*, 1888.)

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2. *Exostosis of orbit.*

By A. Quarry Silcock, M.D.

The exostosis of the left orbit has been growing at least for a period of four years. The patient is thirty-one years of age. When she first presented herself at the hospital, the only symptom complained of was undue prominence of the left eyeball, but no tumour could be felt. The vision was perfectly normal, and the nature of the lesion was not manifest.

At the present time V. = $\frac{20}{100}$, and the optic disc presents the characteristic signs of progressive white atrophy.

(*Card specimen. December* 8*th*, 1887.)

Mr. Spencer Watson agreed with the President in thinking that the case was one in which a careful exploration should be made, but that no attempt to remove the tumour should be made unless its outer limits could be distinctly defined. In some recorded cases these tumours extended into the interior of the skull, and in one operated on by Sir William Fergusson (the particulars of

which will be found, with woodcuts, in the 'Pathological Transactions') a hard ivory exostosis was removed from the orbit, but an extension of the same growth was found to lie in the middle fossa of the skull. It seemed in this case as if the death of the patient, which followed a few days after the operation, had been caused by the inflammation of the intracranial contents as a result of the disturbance of the parts in the orbit, the growth really passing through the sphenoidal fissure into the middle fossa, though by a fracture across it at the time of the operation the whole growth seemed to have been removed. In Mr. Silcock's case it was not improbable that the tumour came from within the cranium, and the fact that there seemed to be no encroachment on the nasal fossa or antrum and that the optic nerve had become atrophied in association with proptosis at an early stage of the case rather tended to confirm the view of an intracranial origin or extension of the growth.

Mr. Adams Frost concurred with the previous speakers in thinking that the removal of the growth should be attempted, but he believed that the operation would prove a formidable one. In his opinion the fact that the proptosis preceded by several months the appearance of the external tumour was strong evidence that the bulk of the latter was deep in the orbit, and that the portion that could be felt was merely one projecting process of a large growth whose base might be in the antrum of Highmore, or in the anterior ethmoidal cells.

3. *Pulsating tumour of orbit.*

By J. W. Hulke, F.R.S.

Thomas T—, æt. 28, came to Moorfields about five years ago complaining of uneasiness in the left eye and confused sight. He attributed this to a blow received three weeks before from a chip of wood off a block he was chopping having flown up and struck the side of his nose; it did not graze or bruise the nose nor leave any mark. On examination, there was found to be slight proptosis, the cause of which was not positively ascertained, thought to be perhaps due to subacute periostitis at the apex of the orbit. Ordered iodide of potassium. Three weeks later the proptosis was greater and pulsation and thrill were then manifest. The common carotid artery was then tied at the Middlesex Hospital, with at first an apparently good result. The pulsation returned later, and he was twice readmitted to hospital, when cavernously swollen vessels at the inner border of the orbit were treated by galvano-puncture and solidified; this was about two years after the original operation. Since then he was not seen until yesterday, when he returned to Moorfields with the present advanced condition of disorder.

Left eye.—V. = $\frac{15}{200}$ and words of 4. J.

Ophth.—O. D. of good colour; veins enlarged; pulsation in both arteries and veins. Media clear.

Pupils equal; active to light and accommodation. This left eye projects one inch in front of its fellow; the cornea is displaced forwards, outwards, and downwards. There is superficial injection. Lids completely cover globe when closed; lower lid pressed firmly against globe so as to obstruct the duct and cause overflow of tears. Ocular movements restricted in all directions. Pulsation and thrill felt in dilated vessels above and to inner side of eye, and traced down facial and

external jugular veins to clavicle. A purring bruit is heard, rather after the radial pulse, occupying the diastole. The changes are strictly limited to the left side.

(*Card specimen. March 8th,* 1888.)

Mr. Adams Frost thought that the patient's history was at least as consistent with an intracranial as with an intraorbital lesion; and, in view of the fact that the former had been found in all the cases which had been fully examined, he would be unwilling to diagnose an intraorbital lesion unless the evidence were very clear. The account which the patient gave him of the accident seemed to differ somewhat from that which he had given to the President, for he stated that the piece of wood that struck him was as thick as his thigh, weighed about fourteen pounds, and that the end which struck him was as thick as his fist. It is difficult to conceive how a body of this kind could inflict a perforating wound, but the accident was just such a one as would be likely to cause a fracture; but the case presented many difficulties whatever view was taken of it.

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4. *Round-celled sarcoma affecting both orbits.*

By A. Quarry Silcock, M.D.

The patient, æt. 9, was first seen on May 24th, 1888. The mother stated that the swelling beneath the left orbital arch had been noticed three weeks previously; there was at that time no pain or redness. On May 10th, a similar swelling was noticed beneath the right orbital arch, whilst that on the left side had rapidly increased in size.

When the child was brought to the hospital, the site and general characters of the swelling were much the

same as they are at present, except that the growths have rapidly increased in size: the fundus of both eyes was normal, the vision equally good in both eyes, and there was no diplopia.

The rapid onset and increase in size of the swellings, their symmetry, the dusky redness of the left upper lid, and the local heat, gave rise to the supposition that the lesions might be inflammatory. They were consequently incised, and a quantity of soft granulomatous growth removed. This, on microscopical examination, presents all the characters of a round-celled sarcomatous growth.

(*Card specimen. June 14th,* 1888.)

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5. *Diffuse sarcoma of frontal bone.*

By A. Quarry Silcock, M.D.

The patient, æt. 20, was first seen at the Moorfields Hospital in May, 1883. She then presented a swelling over the left eyebrow, and extending slightly to the right of the middle line; it was round in outline, smooth surfaced, hard and bony to the touch, and slightly elevated above the general surface of the surrounding bone. The left eyeball was displaced forwards, downwards and outwards. The swelling had then (in 1883) been noticed two years, and was said to be increasing in size. She took iodide of potassium for some weeks without effect, and subsequently was lost sight of until May, 1888. The swelling had meanwhile considerably increased in size, though still preserving the characteristics above described; the orbital arch and adjacent portion of the orbital plate were however evidently thickened, and on deep pressure upwards the orbital plate appeared to "give" somewhat. V. L. – 4·5 D. = $\frac{6}{6}$ nearly. Optic disc normal; field of vision normal. On May 10th, a large piece of the vertical

plate of the frontal bone was removed by means of the trephine and gouge forceps, the dura mater beneath being freely exposed ; that membrane was found to be normal, and the inner surface of the bone smooth. The frontal sinus was entirely obliterated, being filled up by soft porous bone, and the surrounding bone greatly thickened. The orbital plate was, anteriorly, fully half an inch in thickness, and the thickening extended far back, probably to the apex of the orbit. Total extirpation of the growth was thus impossible. Microscopically, pieces of the tumour tissue removed present the usual appearances of a slowly growing sarcoma affecting osseous tissue.

(*Card specimen. June* 14*th,* 1888.)

III. DISEASES OF CONJUNCTIVA.

On cases of spring conjunctivitis.

By Adolf Bronner, M.D. (Bradford).

The cases I have the honour of bringing before you this evening are three of so-called spring conjunctivitis, or, as Saemisch calls it, "Frühlingscatarrh der Conjunctiva."

The first case, Master H—, æt. 10, consulted me in June, 1886, for dull aching pain in and over both eyes after school work, especially after work by gaslight; also of photophobia and pricking pain in the eyes. He has had the same symptoms frequently for the last two or three years, in fact ever since he went to school. The attacks generally lasted four to eight weeks.

On examination June, 1886, vision was $\frac{6}{6}$, H. m. 1·5, 1 J. from 50 – 7 cm. I noticed a slight swelling and drooping of the upper lids, which gave the lad a peculiar and sleepy expression. The conjunctiva of the bulbus and cornea was normal. The conjunctiva of the lids was of a peculiar milky-red colour, thick with enlarged vessels. On that of the upper lid there were numerous elongated swellings, partly round, partly irregular. I looked upon it as a case of so-called follicular conjunctivitis, prescribed lead lotion, and + 1·5 D. glasses for work.

In May, 1887, he called again and said that he had had a very bad attack for ten or twelve days. There was very much photophobia, but not much pain or discharge.

The conjunctiva of the bulbus was much swollen, partly covering the cornea, more so on the nasal and temporal sides, and of grey pink colour. Careful examination showed the swelling to consist of numerous hard, elastic, glandular elevations, pressed and flattened against one another (like pavement stones), of about $\frac{1}{2}$ to 2 mm. in length and breadth. On everting the upper lid, I found similar growths on the conjunctiva on the upper margin of the tarsus, more marked on the nasal side. I removed part of the growths with scissors and prescribed lead lotion and cocaine drops, and in two to three weeks the growths had disappeared, but there was still photophobia, &c.

I saw the lad again a few weeks since, and he has exactly the same symptoms he had two years ago, but *no growths*.

Case 2.—M. C—, æt. 18, consulted me April 24th, 1888. He has noticed for the last five or six years that the eyes have off and on been irritable, could not bear the light so well, &c. He also suffers from hay-fever and thinks that there is some connection between the affection of eye and nose. For the last three to four weeks he has been much exposed to wind, dust, &c., as he has driven daily in a dog-cart. Eyes have felt heavy for ten to twelve days. He cannot bear the light, nor read, &c. Vision of both $\frac{6}{6}$. H. m. ·5 D. There was that peculiar swelling and drooping of the upper lids as in Case 1. The conjunctiva of the bulbus was of a milky-red colour, and much swollen, more so on the nasal side, where it covered about one third of the cornea. The swelling was, as in Case 1, composed of numerous elastic, pedunculated protuberances of pale reddish colour of $\frac{1}{2}$ to 3 mm. in length and breadth. The conjunctiva of the lids was of a grey-reddish colour, but there were no growths to be seen there; slight purulent secretion Cornea and iris were normal. I touched the growths with the galvano-cautery, prescribed lead lotion and cocain drops. In five or six

days the swelling had subsided. Patient was so far improved as to be able to attend to business.

Case 3.—Mrs. F—, about 30, consulted me May 15th, 1888. Ever since childhood the eyes have frequently been inflamed and painful, especially in spring, but never so bad as this year. Both eyes have been red and swollen for the last fifteen or sixteen days. There is not much pain or discharge, but very much photophobia. Both upper lids are slightly swollen. The conjunctiva of the bulbus is much swollen and of a milky-red colour. As in Cases 1 and 2, the apparent swelling is composed of numerous elastic pedunculated protuberances partly covering the cornea. The cornea and iris are normal. The conjunctiva of lower lids is swollen, and of a grey-reddish colour. On the conjunctiva of the upper lids there are many pedunculated growths, but not so numerous as in Case 1.

I will not detain you any longer, gentlemen, by giving you my humble opinion about this interesting disease. I will only say that I do not look upon it as a typical and distinct disease, but simply as a hypertrophic form of a conjunctivitis very common among children, which often partakes of quite an epidemic nature, and which is commonly classified under the name of "follicular conjunctivitis." Of course I do not mean the typical follicular conjunctivitis, which is a different disease altogether.

As regards the history of spring conjunctivitis, I think I need not remind you that Saemisch was the first to describe any cases ('Handbuch der gesammten Augenheilkunde,' vol. iv, p. 25). He thinks that the affection is limited to the limbus of the cornea and occurs only in children.

Brochlaus wrote a thesis on some of the cases of Saemisch.

Horner (Gebhardt, 'Handbuch der Kinderkrank-

heiten,' vol. v) also describes some cases. Vetch, a pupil of Horner, wrote a thesis on some cases, in which he describes the microscopical appearance of the growths. He finds them to consist of a mass of proliferating epithelium cells which have quite the appearance of an epithelioma.

Emmert, of Bern, published twenty-nine cases in March, 1888 ('Centralblatt für Augenheilkunde'). He divides the affection into three classes: (1) In which the limbus only is affected. (2) In which the upper lid only is affected. (3) In which both are affected.

De Wecker ('Traité complet d'Ophtalmologie,' vol. i, p. 351) looks upon spring conjunctivitis as a kind of phlyctenular conjunctivitis.

(*July 6th*, 1888.)

IV. DISEASES OF CORNEA AND SCLEROTIC.

1. *Colouring matter, ? blood pigment, in cornea.*

By J. B. Lawford.

Alice B—, æt. 27, admitted to Royal London Ophthalmic Hospital, under the care of Mr. Couper, July 21st, 1887. The sight of L. eye had failed suddenly in December, 1882.

She attended then as an out-patient, and the notes say "detached retina" in L. and opacities in vitreous.

A fortnight before admission she had severe pain in left eye. When admitted to hospital the condition of left eye was: A greenish mass seen behind cornea, apparently iris, against posterior surface of cornea. No reflex from fundus. T. + 2; no p. l.

R. − 10 D. V. = $\frac{20}{70}$; T. n.

After removal of the left eye, the appearances noted were:

Cornea.—Opaque in central part, and of greenish colour; the peripheral part, however, is nearly clear, and looks rather red. The difference in colour of the central and peripheral parts depended to a certain extent upon the contents of the A. C., viz. partially decolorised blood, in a thick, treacle-like fluid. When this background was removed, the cornea was still opaque in central part, which now looked red, and nearly clear at periphery, but the green colour there had disappeared. The cornea showed no other naked-eye change, and I thought the unusual appearance was due to blood in the substance of the cornea, though I did not see why it should be limited to

the central part. As regards the other parts of the eye, the retina was detached and folded in a narrow stalk, the iris and ciliary processes were much retracted, and the anterior part of the choroid drawn inwards (see specimen). The subretinal effusion contained much cholesterin.

In sections the cornea to naked eye had a brownish opaque appearance in central part, the periphery being nearly clear and transparent.

Examined microscopically the difference is quite as noticeable, and the line of demarcation between the coloured and clear part is sharp. The colour of central part (the diameter of which is 6 mm.) extends through the whole thickness of the cornea, and is due to innumerable small refracting particles or granules in the corneal tissue. These granules, which are about a quarter the size of red blood-cells, stain with eosin but not with hæmatoxylin. Their colour does not wash out in spirit or other fluids employed in the preparation of the specimens. I unfortunately have not been able to ascertain their spectroscopic reaction. The granules are in the corneal stroma and not in the interspaces, at least in sections. It is of course not improbable that those in the interspaces would be washed out from the sections.

At periphery of the cornea there are a few new vessels (in the clear area), but in the central part only in one section could I find a vessel, and that a small one. There is nothing like blood extravasation in the cornea. The corneal tissue shows no other alteration except some possible enlargement of the interspaces between the bundles. The anterior epithelium is atrophied and degenerate, the posterior and Descemet's membrane are unaltered.

(*May 3rd*, 1888.)

2. *Tumour of the cornea.*

By F. R. Cross (Bristol).

(With Plate V.)

William W—, Monmouth, a plasterer, æt. 51, a spare but healthy man.

The upper and inner third of the left cornea is covered by a lobulated growth of a reddish-brown colour, 10 mm. long, 5 mm. wide, 1—2 mm. in thickness, with a finely vascular surface.

The growth is mainly bounded inside and above by the edge of the cornea, which it overhangs ; it scarcely implicates the sclerotic. At one spot on the corneal margin it is bluish in colour and shows one or two black pigmented points, which suggest implication of the ciliary body.

The neighbouring conjunctival veins are enlarged and somewhat increased in number, but the episcleral vessels are normal, except along the very edge of the growth, where there is a narrow vascular zone, best marked in the sclerotic portion. The upper edge of the cornea shows a thin line of infiltration fed by small circumcorneal vessels.

Towards the pupil the tumour is bounded by a distinct line of demarcation, passing obliquely down and out just free of the pupil. Here the neoplasm is continuous with perfectly healthy cornea, which, however, shows a band and slight error in giving parallax with the ophthalmoscope. The deeper layers of the cornea seem free ; there is no evidence of implication of the anterior chamber. The pupil resembles its fellow in all respects. Tension normal. Vision : R. $\frac{20}{20}$, 6 J. ; L. $\frac{20}{40}$, 6 J. barely. Accommodation does not seem impaired, but patient cannot read. Media elsewhere and fundus quite healthy.

Patient says two years ago he had a little brown spot

DESCRIPTION OF PLATE V.

Illustrating Mr. Cross's case of Tumour of the Cornea.

Fig. 1.—Represents the eye drawn from life by Mr. E. Burgess in June, 1887.

Figs. 2 and 3.—The appearance of the eye in July, 1888, drawn from life by Mr. Wright, and copied by Mr. Burgess.

E.B. del.

Fig. I

Fig. III.

Fig. II.

E. Burgess ch. lith

on the edge of the clear part of the eye, which he thinks entirely disappeared. He does not remember any other irritation or inflammation. For nine months he had occasionally found difficulty in movements between the eye and the upper lid.

Six months ago his friends noticed a skin coming on the eye; he then saw it was half as large as now. He considers its growth still slow, and has only noticed the sight affected five weeks. No pain nor tenderness. Occasionally feels irritable, but practically gives no discomfort; does not discharge.

Removal of the eye was recommended but the patient refused and went home.

Patient exhibited.

(*June 9th*, 1887.)

July 16th, 1888. — To-day the appearances have entirely altered; the whole cornea is implicated in a very prominent staphyloma, similar to what might result in buphthalmos after ulceration. The surface is smooth, non-vascular, and lobulated; it protrudes forward to the extent of nearly a centimetre, and is only slightly most prominent where the growth originally commenced. The colour is greyish with a blue tinge. The patient has complained of no pain, nor even of the mechanical difficulty which is present in closing the lids. There is no evidence that ulceration or inflammation has taken place. A narrow rim of congestion lies over the whole circumcorneal margin, but there is no implication of the sclerotic nor any marked congestion of the conjunctiva. The globe behind the cornea is not enlarged, but T. + 1. Bare perception of light. The patient's health is excellent, but he is getting thin; he still declines any operation.

3. *Chronic abscess of cornea.*

By R. Marcus Gunn.

John L—, æt. 40, joiner, attended Moorfields Eye Hospital on September 20th last.

In the beginning of August the left eye became slightly painful, and he then noticed a white spot upon it. The pain lasted for about a week and has not returned.

On examination, the left eye showed conjunctival injection, and a whitish, well-defined, local opacity was seen in the upper part of the cornea beneath the epithelium; p. a., T. n., V. = $\frac{20}{30}$. Ordered Lot. ac. boracic.

September 24th.—Still injection. Pupil acts sluggishly. No pain. Iris slightly discoloured. T. n. The white deposit pricked with a fine needle but nothing escaped. Ordered gutt. Atrop. fort.

27th.—Pupil not well dilated, but ciliary muscle well under atropine.

October 1st.—I saw the patient to-day for the first time, and ordered hot fomentations with continuance of the atropine drops.

5th.—Pupil not yet well dilated. To continue Fot. and gutt. Atrop., to take Hydr. $\bar{c}$ Cret. gr. j, 4 d.

7th.—The deposit is more or less heart-shaped, measuring about 2 mm. in its longest diameter and is situated about 2 mm. from the upper corneal margin. It is of a light yellow colour, very dense, and bordered by a series of very fine yellowish points, giving to the naked eye the appearance of a nebular halo round the central deposit. The epithelium over it is perfect. The pupil (under atropine) only measures 5 mm. but is round and regular. There is slight conjunctival and ciliary injection. T. n. both. R. V. $\frac{20}{20}$, H. m. 0·5 D., 1 J. with good range; L. V. $\frac{20}{20}$ partly, improved by + 0·5 D. cyl.; accommodation quite paralysed by atropine.

Ophth.—Fundus normal in both.

Patient is a well-nourished, strong-looking man of medium size and fair complexion with delicate skin. His general health is very good, with the exception of occasional rheumatic pains, chiefly in the shoulders. Parents both living; father is also rheumatic. Doubtful family history of phthisis. No history of syphilis. He had gonorrhœa eight years ago.

October 19th.—The deposit in cornea is decidedly less within the last ten days or so.

(*Card specimen. October 20th,* 1887.)

V. INTRA-OCULAR TUMOURS.

1. *Tumours of the ciliary body.*

By P. H. Mules, M.D.

(With Plate VI.)

Thanks to the generous manner in which many of my friends have seconded my efforts I am enabled to bring together a series of ciliary growths which may not be devoid of interest. To the President of this Society (Mr. Hulke), ophthalmology is indebted for many valuable researches, none more so than into the etiology and pathology of intra-ocular tumours, but, so far as I know, there are no collected records of the class indicated above if we except Knapp's monograph of twenty years ago, and Fuchs's memoir on intra-ocular tumours of more recent date. Thus I have been compelled to traverse a considerable range of ophthalmic literature to gather together the cases which I have tabulated. The rarity of primary growths of the ciliary muscle (or any portion of the ciliary body), if we except gummata and tubercle, has much to do with this, for no clinique can show more than two or three, and thus Knapp's view that "the ciliary body is frequently the seat of sarcoma" is negatived. At the outset we are required to define these growths, and here, by sharply drawing the line at *primary* ciliary origin, or at least secondary formations which *primarily* spring from the ciliary body, and do not extend by continuity from the adjacent choroid or iris, we again traverse Knapp's view of their frequency by showing that of six cases claimed by him as "ciliary sarcomata," only one is primary or springs directly from the ciliary body. In the second place are we to include

gummata and tubercle? The answer is in the affirmative, but under such restrictions that I have not placed them in the Table, but avail myself of the kindness of Mr. McHardy* and Mr. Priestley Smith to show a "ciliary syphiloma" to illustrate the first, whilst a case of my own, of tuberculosis, illustrates the second. In neither can I with certainty say whence the growths sprang, but they have probably in both extended from the iris.

There are left the two arbitrary divisions of so-called benign and malignant.

Of the former, we have two myomata, classical cases from the cliniques of De Wecker and Vose Solomon. The latter I am enabled, by the kindness of Mr. Solomon, to show.

Of the latter, we have *sarcomata* represented by the "spindle-celled variety;" a mixed round- and spindle-celled, a specially interesting example, probably retrograde, of cysto-sarcoma; Cowell's case; and one from my own clinique which Dr. Brailey has kindly examined and reported on for me, and which I may call a "transition tumour," for whilst it has many of the characteristics of a pure spindle growth, the cells are associated with others having all the appearance of unstriped muscle-cells. There is practically no fibrous tissue, only a connective-tissue framework. Now, it was this case occurring in a woman, aged thirty-eight, which specially directed my attention to this group of "ciliary tumours." It is a typical example of them. The minute details are reserved for an appendix.

The Diagnosis of Ciliary Tumours.

Doubtless the diagnosis in the early stage of growth, unless associated with an irido-dialysis, may be extremely difficult.

1st. We have no evidence that ciliary tumours cause pain or uneasy sensations until they have attained a considerable size.

* McHardy's case, Plate VI, fig. 5.

2nd. From their situation the tumours cannot be seen at an early stage with the ophthalmoscope, nor do they in any way interfere with vision until growth causes pressure on, distortion, and in some cases absorption, of a segment of the lens. This was first noticed in De Wecker's case; it is also well marked in mine, and Brailey has noted the fact, for he likens it to "a part of the capsule of a shrunken lens," although he had no previous history of the condition of the lens to guide him.

In a remarkable case of this nature from the clinique of Professor Graefe, of Halle, by the kindness of Dr. Bunge I am enabled to refer to an example of distortion of the lens where the growth of the tumour had induced absorption of the centre of the lens only, so that it was kidney-shaped.

(3) Increased tension with glaucomatous change, when present, is a late development.

(4) The early or late appearance of the growth in the anterior chamber through an irido-dialysis is no measure of its size, but rather of the seat of the disease; for if the tumour originates in the anterior fibres of the ciliary muscle, or if the base of the iris becomes rapidly implicated, then separation of the iris from its scleral attachments will occur primarily, or at least very early, and a tumour, or a portion thereof, present through the irido-dialysis; whilst, if the growth commences in the posterior ciliary fibres, or is an extension from the adjacent choroid, it may attain the dimensions of a small cherry without causing any irido-dialysis. This was the case in an eye containing a ciliary tumour removed by Mr. Hulke, and recorded by Mr. Nettleship,* but it is specially noteworthy that the iritic separation was on the point of taking place.

(5) Recurrent hæmorrhage into the anterior chamber is a frequent accompaniment and masks the diagnosis, even if there be an irido-dialysis.

(6) *Separation of the retina.*—The anatomical relation of parts, as Knapp pointed out in a discussion in Paris,

* Appendix, Case 10.

where he was opposed by De Wecker, permits a ciliary tumour to develop its full size without separation of the retina. That this is so is undoubted, for here again Mr. Hulke's,* Mr. Cowell's,† and my case‡ are proofs of the correctness of his view. Clinically, many of those recorded are associated with retinal separation of the kind seen in a drawing from Professor Hirschberg's section which accompanies this paper.

We thus have two conditions under which a diagnosis may be required.

First, where a tumour presents in the anterior chamber as a reddish-brown mass of varying size at the base of the iris or through an irido-dialysis.

Second, where no irido-dialysis exists, and where no tumour can be seen through the pupil, a growth being only suspected.

In the first, our diagnosis must lie between a ciliary tumour and a growth at the base of the iris, a very important difference, and if you refer to Dixon's case recorded by Waren Tay, 'Ophthalmic Hospital Reports,' vol. v, p. 230, you will see that it is by no means easily determined, yet so far as my researches go we may assume that a growth at the base of the iris, *combined with* an irido-dialysis, is absolutely diagnostic of ciliary tumour. But the converse does not hold good,—that a growth on the iris in the anterior chamber, *without* an irido-dialysis, is as certainly confined to the iris. For you may have a ciliary tumour, with secondary buds on the anterior surface of the iris, but no irido-dialysis (Prout's case, Appendix 9).

In the second, where no irido-dialysis exists, the difficulty is much increased, but even here, if there is a bulging outwards in the ciliary region, there is a means of distinguishing between the early commencement of staphyloma and a growth. This is by directing a small but powerful beam of light on the projection. Should there be an opaque mass the beam cannot enter the globe; should a staphy-

* Case 10. † Case 3 ‡ Case 14.

loma alone be present, the light is easily seen in the interior of the eye. For practical use I may say that I have carefully experimented with this method, and find it only of value in cases where the natural tunics are much thinned. In one case four or five years ago, where the divergence of opinion was very marked, it enabled me to arrive at a correct conclusion, the eye being afterwards removed, and only a staphyloma found.*

A year or two ago a Russian ophthalmologist suggested the same method of diagnosis, whilst Knapp localised a ciliary tumour by holding a freshly enucleated eye between himself and a gaslight.

As a further means of diagnosis Knapp suggests the use of a mirror *noting the absence of reflex over the part occupied by the tumour.* The knowledge thus gained may show the existence of an opaque mass, but can in no way determine its seat. *There is a third method.* I mention it because I show here an example of its danger, although in ciliary tumours it can be rarely possible. I mean the differentiation of malignant growths from harmless retinal separation by "acupuncture." This drawing,† taken from a patient of one of my colleagues, who has kindly allowed me to show it, is an example of rapid change from intra- to extra-ocular melanosis due to acupuncture. The external development evidently followed the track of the needle, and became as you see it in less than four weeks, whilst the case of Otto Becker further accentuates the warning, for there acupuncture was followed by orbital infiltration and death in three months (Knapp, 'Archiv für Ophth.,' vol. i, p. 708). Obviously immediate enucleation should be performed if a tumour be found by acupuncture.

To revert to the value of early and accurate diagnosis, let me instance two cases from the clinique of Dr. Little, and Dixon's case previously referred to, and reported by Waren Tay, kept under observation ten years.

* Dr. Knapp informs me he has published this method some years since.

† Dr. Emrys-Jones's case, Plate VI, fig. 4.

Little removed a sarcoma of the iris successfully and without recurrence. He referred to a second case ('Lancet,' vol. i, 1875, p. 82) under observation four years, when the eye was removed, the impression being that the growth was ciliary. It was found strictly confined to the iris, it had scarcely bulged back, and had in no way involved the ciliary muscle. Could an accurate and early diagnosis have been made, the experience gained by Little's successful case shows that Dixon's and Little's second case might have been removed without sacrificing the eyes.

What determines the seat of these muscle growths? I stated, in a paper read before the British Medical Society in 1887, that idiopathic ciliary tumours always arose opposite the internal rectus muscle, and singularly enough in the first five cases I found them there. Further search has shown me it is not so; for in the Table appended there are thirty-two cases five of which are of doubtful primary origin. Accident has determined the point of development in two. A third, Hirschberg's (Case 16), is doubtful although the eye had suffered from injury. Six, including the myomata, are directly inwards. One not recorded. The remainder have selected various sites. Of the two cases determined by accident, (Case 10) Mr. Hulke's, examined by Nettleship, is specially interesting, for although the patient, a girl of eighteen, received a severe blow on the eye the globe does not appear to have ruptured, yet, corresponding to the external point of impact, marked by a scar, there developed an internal, pedunculated, spindle-celled sarcoma. The other (Case 13) of my own, in a boy aged twelve, is in contrast to Mr. Hulke's; it (the tumour) too, has developed from the ciliary muscle at a point corresponding to an injury which *did* rupture the sclera; the growth you see is almost entirely extra-ocular, not unlike at first sight an epibulbar tumour but more papillated; it sprang from the ciliary muscle, growing through the rupture, and, as is so often the case, increased rapidly on the outside of the eye

(see Plate VI, fig. 1). The microscopical appearances, according to Dreschfeld, who carefully examined it, prove it to be a round, and spindle-celled sarcoma. It had been twice previously removed by Mr. Windsor, V. with lens being ½ normal. The ages of these two are interesting from the infrequency of sarcomata in young people. We will finish the question of locality by noting the observations of Fuchs in his 'Memoir on Sarcoma of the Uveal Tract,' p. 10, for in sixteen reported cases of sarcoma of the iris nine were developed directly downwards.

Method of development.—I need scarcely refer to the debt that general owes to special pathology, but point to the development of ciliary tumours as illustrating the attack on unstriped muscle tissue, of growths, malignant and otherwise. For although I have thought it well to class these growths as tumours of the ciliary body, all those of primary origin appear to commence in the ciliary muscle, hence their interest. To the pathologist we present myomata identical with those found in other organs. And it is a fair speculation whether these growths are not originally congenital, having something in common with the muscle tumours of the kidney, their further development being induced by nerve irritation.

In the ciliary sarcomata we can show how the unstriped muscle tumours of other parts of the body originate, develop, and degenerate, for what has been seen in the muscular tissue of the iris may be as easily traced in the muscular tissue of the ciliary body, so that the views of Dreschfeld and Sokolow can receive ample corroboration, that "sarcomata originate by nuclei deposited in the intermuscular connective tissue, that the nuclei proliferate, become surrounded by a granular matrix eventually forming spindle-cells, and gradually absorb by pressure the muscular fibre among which they develop." The views of Wagner, that "spindle-cells may even develop from the muscle-cells themselves," receives considerable colour from the fact that the specimen before you—my

own preparation—presents portions identical in structure with muscle-cells insensibly gliding into shorter spindle-cells forming a connecting link between malignant and benign growths. Of the retrograde metamorphoses, Graefe's case is an admirable illustration of the cure of malignant growths by fatty change; whilst Cowell's—the microscopic record of which we owe to Mr. Hutchinson—shows retrogression in the form of mucoid cysts.

The irido-dialysis, its cause.—I believe I can show that the separation of the iris from its scleral attachment may be induced in three ways, and is of some importance from a prognostic point of view.

1. Purely mechanical, as in Knapp's case, where the separation occurred under observation at a late period of the disease.

2. By absorption of the anterior fibres of the ciliary muscle into the tumour whereby the base of the iris has its point of attachment in the growth, is carried up by it as it enlarges, but structurally remains unchanged (see my case).

3. The iris becomes attached by an inflammatory process to the front of the tumour and is forcibly torn away as the growth enlarges; this is seen in Hirschberg's case.

In Nettleship's report of Mr. Hulke's case, and markedly in my own, the new cells are seen in advance of the main tumour (in Mr. Hulke's on the verge of producing an irido-dialysis), and they appear to pass outwards thus:—You know that Descemet's membrane is inserted into, and forms the pillars of, the iris; with the growth of the tumour and formation of an irido-dialysis the iritic attachments of Descemet's membrane hold, and it is slowly peeled off the cornea, doubled on itself, and lays open the spaces of Fontana right up to Schlemm's canal for cell invasion. This can be seen in any of my sections, but in Hirschberg's there is no cell advance.

Treatment.—A glance at the history of intra-ocular malignant growths shows the extraordinary resisting power of the sclera to the invasion of their cells, but

growths that can surely disintegrate bone, will, given time, as surely find their way through the sclera, and in two of Knapp's cases the sclera was perforated, the growth becoming extra-ocular. This being so, the rules which obtain in the treatment of choroidal malignant growths hold good in ciliary tumours. Yet the case by Professor Rosas recorded by McKenzie, bears on this very important point. Rosas removed a ciliary tumour with the lens and some vitreous, but the eye recovered insomuch that perception returned, and the growth did *not* recur.

The after-history.—We have the after-history of only a few; one of Ammon's recurred viscerally. Mr. Hulke's case remained well after four years. One of Graefe's died after four years from sarcoma; this case was complicated with syphilis. Three of Knapp's died of sarcoma, but in these the growths were secondary. De Wecker's myoma of course did not recur, nor has my case suffered from any recurrence. Of the remainder I can say nothing.

In the form of an Appendix I have given a short abstract of all the cases I can find recorded to the middle of 1888, and beg to express the great assistance I have found from Fuchs's paper before mentioned. The examples of ciliary tumours are thirty-two. The difficulty of determining the *primary* origin or otherwise of many of these is very great, some, quoted by other authors, being so obviously *secondary* that I omit them without any hesitation. Added to the abstract is a complete account of my own cases* with the microscopical examination of one of them by Dr. Brailey.

Appendix.

Case 13.—A boy, æt. 12, from an industrial school, attended the clinique at Manchester Eye Hospital October 11th, 1876. Had lost his right arm from necrosis (amputation).

The left eye received a severe blow producing upward

* Cases 13 and 14.

DESCRIPTION OF PLATE VI.

Illustrating Mr. Mules's paper on Tumours of the Ciliary Body.

Fig. 1.—A round-celled sarcoma of the ciliary muscle projecting through an upward scleral rupture from boy, æt. 12. (See Case 13, Appendix.)

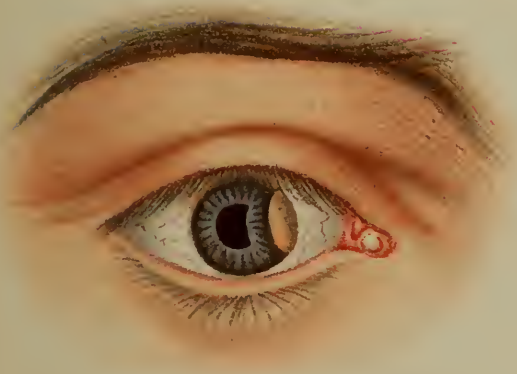
Fig. 2.—Myo-sarcomatous tumour of the ciliary muscle; eyeball *in situ*. (See Case 14, Appendix.)

Fig. 3.—Section of eyeball (Fig. 2) showing ciliary origin of growth and displacement of lens with segmental absorption. (See Case 14, Appendix.)

Fig. 4.—Intra-ocular melanotic sarcoma, becoming extra-ocular after acupuncture.

Fig. 5.—Syphilitic infiltration of the iris simulating malignant neoplasm, inducing intense glaucoma.

2



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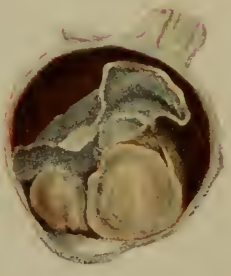

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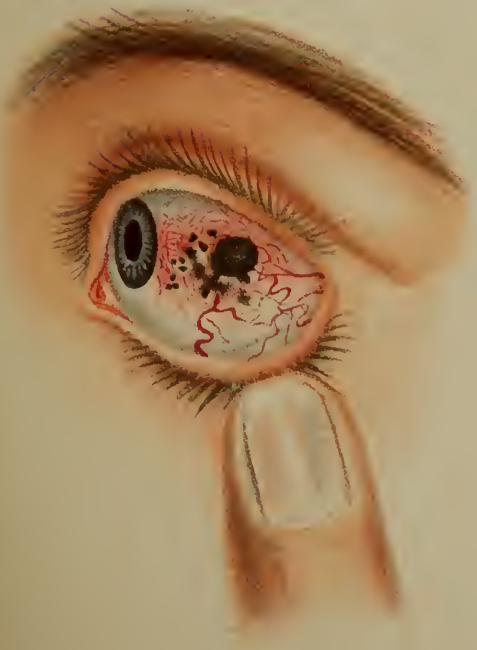

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West, Newman & Co. chromo. lith.

scleral rupture with entanglement of iris and coloboma. It is obvious that the rupture was in the ciliary region. The eye bled and the lens escaped. Projecting from the ciliary wound and connected with the ciliary body is a papillated growth $\frac{5}{8}''$ in its long diameter, $\frac{3}{8}''$ in its short diameter; it covers the upper fifth of the cornea, and in its length lies parallel to the palpebral fissure. The growth was very vascular, two large tortuous vessels lying on its surface. A dark mark is visible in the centre showing the position of the scleral rupture, but the growth is free from pigment; V. without lens 12 J., with lens $\frac{1}{2}$ normal. It appears to have commenced as a small sarcoma, so like a papilloma that it was removed by Mr. Windsor. It recurred; he again removed it. After the second removal it recurred, grew rapidly, and I removed the eye on the same day that the patient attended the clinique (see Plate VI, fig. 1).

Microscopical examination by Dreschfeld showed a sarcoma with round-cells in abundance and here and there a few spindle-cells probably derived from the ciliary muscle.

Case 14.—E. B—, female æt. 38, admitted as an in-patient of the Manchester Eye Hospital on October 7th, 1887. The patient first presenting herself on that day, the disease was recognised by Dr. Hill Griffith, who was acting for me, and the notes of her condition at the time are a transcript of his.

History.—A failure of sight for four months. One month previous to her attending my clinique she noticed something yellow growing over the sight. No history of cancer in the family.

Appearance of the eye.—At the inner margin of the corneo-scleral junction is a yellowish-brown tumour, which is visible through an irido-dialysis, and pushes the iris towards the centre, altering the pupil to the shape of a thick crescent. Examined with the ophthalmoscope, striæ are visible in the lens. At the inner side, running towards the optic disc, a projecting mass of light brown colour is

seen through the pupil; no vessels are visible on it. The disc is hidden by the growth; no separation of retina noted. V. fingers inwards. T. n. (Plate VI, figs. 2, 3).

Further examination by Dr. Mules, the Patient being in the Hospital.

He notes that the brown mass in the anterior chamber appears almost translucent, with many vascular points; there is also a hæmorrhage on the iris. A vertical division runs down the growth, showing it to consist of lobes.

The eye was removed two days later, and she left on the 13th. She is still well.

The globe was hardened in Muller's fluid, frozen, and divided antero-posteriorly through optic nerve and cornea. The tumour was cut through without disturbing its relation with other parts of the eyeball.

This tumour, spherical in shape and like the kernel of a small nut, measured 1 cm. from before backwards, 9 mm. in height, covered by a closely adapted retina; its apparent origin was the anterior fibres of the ciliary muscle. It lay closely applied to the sclera, running backwards 7 mm. Its summit at the anterior part was in apposition with the lower and posterior segment of the lens, which it had atrophied by pressure, at the same time forcing the upper and outer edge against the ciliary processes to the imminent risk of glaucoma. The iris was separated in its broadest diameter 3 mm., so that the tumour presented in the anterior chamber through a considerable opening. A portion of the tumour was removed for microscopic examination. Carefully embedded in paraffin by Dr. Harris, of Owens College, Manchester, to whom I am much indebted for the beautiful sections he cut and mounted, they were submitted to Dr. Brailey, and I append his report. The remaining portion of the eyeball appeared perfectly healthy, nor, so far as could be seen, was there the least evidence of increased tension (Plate VI, fig. 3).

Dr. Brailey's Report.

The specimen submitted to me showed a vast thickening of the ciliary part of the uveal tract, which thickening ends towards the centre of the eye by a rounded surface, along which can be traced the pigment epithelium layer normally underlying the pars ciliaris retinæ, but in place of this latter layer a more nucleated and considerably thicker stratum is seen, as if a fibrous layer, probably of low inflammatory origin, were there being formed, thus constituting the extreme inner boundary of the mass. Anteriorly there is rather more evidence of a proliferation of the pigment layer, and at one spot near the iris there is some appearance of a double fold of structureless membrane (with some nuclei contained in its cavity), which may be part of the lens capsule of a shrunken lens.* The new formation passes into the base of the iris just as the ciliary body does; the iris is otherwise quite healthy in structure, size, and position, and exhibits no evidences whatever either of inflammation or increased tension of the eye. The choroid behind the posterior border of the new growth is perfectly healthy; where it touches the growth it is thickened by a deposit of nuclei in its outer layer, but not to any great extent. These nuclei apparently belong to somewhat elongated cells and stain but moderately (logwood), thus evidencing no high degree of inflammation at any time. The innermost layer of the choroid and epithelium layer which lines it internally can be traced for a long distance as we pass forward; though these layers are always somewhat hypernucleated and though the pigment epithelium tends to look altered as we pass forward, at first being less regular and somewhat proliferated and then leaving deposits on its inner (central to the eyeball) surface, they do not exhibit inflammatory changes in any degree corresponding to the size of the new mass. This—the new mass—is made of elongated spindle-cells, each with a

* The lens had atrophied in its lower and inner segment.

single central, small nucleus; these cells are interlaced in a reticulated manner, forming interlacing bundles with intervening spaces, which are occasionally wide; the arrangement is more close and the nuclei more abundant near the free surfaces, especially the inner (central). In these regions the reticular arrangement can scarcely be traced, therefore in unteased portions of these parts the cells cannot definitely be said to be spindle. The mass contains numerous vessels; the reticulated appearance gives it a somewhat cavernous aspect, at first looking as if it might be nævoid. I do not think this is so, but that the growth is allied to involuntary muscular fibre, being, in fact, a tumour derived from the muscular tissue of the ciliary body and allied to it in structure. The cornea and sclera are healthy.

Further note by Dr. Mules.

It is only fair to state that the opinions of Drs. Dreschfeld and Harris do not bear out the views of Dr. Brailey; they consider the neoplasm to be distinctly sarcomatous, the cells being of the true spindle variety.

A very careful examination of freshly-cut sections, double stained, by Dr. Robinson, of Owens College, whose views are in the main identical with mine, leads me to believe that the growth is really a myosarcoma; that whilst the sarcoma elements are there and many of the cells are short spindled, there can be no possible doubt that muscle elements are diffused throughout the tumour, or, to speak more accurately, that cells identical in appearance with muscle-cells can be seen in every direction. How many of these are connective-tissue cells I cannot say, but it is well to remember that the appearances are identical, the difference being only determined by chemical reagents. The vessels are embryonic, there being no recognisable walls, and the cells have passed forwards, filling up the spaces of Fontana, Descemet's membrane being slowly torn off the cornea and doubled on itself by the growth of the tumour, which carries up the iris with the pillars attached.

Case.	Author.	Sex and age.	R. or L.	History.	Appearance of growth and eye at date of removal.	Locality.	Vision.	Pathological examination of.
1	Graefe, A. f. O., 1866, vol. xii, p. 233	F., 20		Peculiarity noticed for last two years, with slight pain on use of eyes	A dark brownish mass filling the anterior chamber in its width, presents through an irido-dialysis; pupil dilated, and a corresponding growth seen at back, displacing lens.	Downwards and outwards	Half normal, field intact	By Virchow. Tumour springs from ciliary ligament, and consists of a fairly vascularised spindle-celled sarcoma with an admixture of pigmented round-cells.
2	Graefe, A. f. O., 1866, vol. xii, p. 234	F., 43	—	In 1864 a brownish-red mass, ¾ inch high, was seen to project through an irido-dialysis, pushing the lens up and visible through the pupil; no pain, but signs of old syphilis and headache. Vision ¾ normal	In 1868 cataract, with violent neuroses; glaucoma; eye inflamed; blood in anterior chamber; aqueous turbid; iris disorganised; eye removed	Downwards	0	By Virchow. A lobulated ciliary tumour half filled the globe; total separation of retina. Tumour has undergone fatty degeneration, but enough remains to determine an alveolar sarcoma; shape of cells not noted; growth commencing to penetrate sclera; gumma developed 2 years after removal of tumour. Cured by Pot. Iod. Four years after enucleation death from sarcoma of liver.
3	Cowell, O. H. Rep., vol. v, p. 188, 1886	M., 24	L.	Noticed spot on iris 4 months before coming to hospital; no pain nor irritation; foggy vision	Yellowish-grey mass presenting through an irido-dialysis 3‴ by 1½‴; visible through pupil after atropine; lens pushed in	Downwards and outwards	Fingers	By Jonathan Hutchinson. Non-pigmented growth, size of hazel nut; no separation of retina; growth attached to ciliary muscle by narrow pedicle; no tendency to invade other structures. Tumour: alveolar with round and oval cells, and here and there cyst-like spaces filled with a transparent almost mucoid substance.

Case.	Author.	Sex and age.	R. or L.	History.	Appearance of growth and eye at date of removal.	Locality.	Vision.	Pathological examination of.
4	Wells, Lancet, January 2, 1870	F., 39	—	Three years noticed spot on iris T. + 1; commencing cataract	Brownish growth size of a split pea presents through irido-dialysis and touches cornea; lens compressed	Inner	J. 18, field normal	Presumably by Wells. Growth springs from the ciliary muscle; no separation of retina; is a spindle-celled pigmented sarcoma, iris irregularly pigmented? no cell arrangement in iris.
5	Knapp on Intra-oc. Tumours, p. 135	F., 62	L.	Dim vision 10 weeks; lens shows rays; 3 months later appeared with glaucoma and severe pain.	With ophthalmoscope a dark movable mass is seen downwards and outwards; with focal illumination a prominence is visible of a dirty greyish-red colour lying close behind the lens	Down and out	Fingers	By Knapp. A round tumour size of a hazel nut was attached by a slender pedicle to the ciliary region; no retinal separation; the growth consisted of round, spindle, and fusiform cells; sclera scantily infiltrated.
6	Mr. Hulke, unpublished, R. L. O. Hosp., registered number of specimen 2481	F., 47	L.	Sight of L. failing 3 months; defect has steadily progressed; pain for past 4 or 5 weeks; friends have noticed a black speck in L. for 3 years; no injury to eye; no family history of cancer, but father and two others died from paralysis of cerebellum	Venous engorgement of conjunctiva, nasal and lower part; anterior chamber shallow; pupil active, oval at nasal side; in angle of anterior chamber is a brown nodule size of split pea projecting through irido-dialysis; mass size of small almond seen with ophthalmoscope; right eye normal	In and down	$\frac{10}{200}$	By Lawford. Eye frozen and divided; a large, rounded, partly pigmented growth at nasal side, projecting through irido-dialysis, and extending backwards to equator; no retinal separation; ciliary muscle and iris are pushed inwards by tumour; lens also displaced; ciliary processes absorbed over tumour area; mixed spindle- and round-celled pigmented sarcoma; muscle-fibres distinguishable; iris invaded at root.
7	Unpublished, Mr. Waren	M., 35	R.	Sight of right eye failing 3 or 4	Cornea, anterior chamber, and iris apparently	Upper	$\frac{20}{200}$	By Lawford. Eye frozen and divided; at upper part, close behind lens, a light-

	R. L. O. H., registered No. 2375			no injury; family history good	upper part a pinkish-yellow mass, with vessels on its surface and a striped pigmented appearance; right eye hazy; a short distance up and out from disc is a greyish raised patch			wards centre of vitreous; its base extends from root of iris backwards 9 or 10 mm.; height 9·5 mm.; the retina is detached from the disc to the apex of growth in upper half of eye; unpigmented round- and spindle-celled sarcoma; ciliary muscle and processes pushed in and forwards; root of iris invaded.
8	Knapp, A. für Ophth., i, 1869–70, p. 490; doubtful primary origin	F., 73	R.	Pain for 6 weeks; vision poor	Eye red, tender, photophobic, and congested; iris discoloured with vascular streaks; posterior synechia; T. slightly increased. After two days' careful watching an irido-dialysis appeared, and a dark yellow swelling was seen at the point of the iris separation; eye removed 10 days after	Outwards	Fingers	By Knapp, who localised a ciliary tumour by holding the enucleated globe between himself and a gaslight. On opening, a neoplasm, size of a hazel nut, was seen to spring from the ciliary region and adjoining choroid; no separation of retina; a thin membrane stretched across the equator of vitreous; embryonic tissue neoplasm; a spindle-celled sarcoma lightly pigmented commencing to infiltrate sclera; ciliary muscle entirely absorbed; growth commenced in outer choroidal layers, perhaps the ciliary body.
9	Prout and Charles Bull, A. für Ophth., vol. x, p. 140; doubtful ? primary origin	F., 35		Three weeks ago sight failed; no pain, but change of colour seen in iris at lower part, which was nodulated with small white vascularised masses	Ophthalmoscope showed a pinkish-mottled growth springing from anterior part of choroid or ciliary body; retina detached; eye removed 10 days from first visit	Outwards and downwards	Foggy	By Bull. A slightly pigmented sarcoma consisting of round- and spindle-cells, commencing in the inner choroidal layers, extending both towards the disc and the iris; the ciliary muscle was specially infected by spindle-cells, whilst the iris was crowded with round-cells; no irido-dialysis nor pressure on lens.

Case.	Author.	Sex and age.	R. or L.	History.	Appearance of growth and eye at date of removal.	Locality.	Vision.	Pathological examination of.
10	Hulke, Oph. Hos. Repts., p. 264, vol. viii	F., 18	R.	Struck eye with sharp stick; sight impaired; cataract formed; removal by suction; field bad; constant pain 4 months after operation; eye removed 18 months after accident	Pupil acts slightly, but is blocked; iris not discoloured; a linear depressed scar 6 mm. long upper and outer part of corneo-scleral junction; T.+; eye very tender; special congestion of ciliary veins	Upper and outer	Perception of light	By Nettleship. No retinal separation; a rounded dark tumour, cherry size, found attached to the ciliary region at seat of accident; the growth had a wide base, increasing in width from before backwards, and consisting of fusiform and spindle-cells; an irido-dialysis was on the point of forming, apparently by the pushing forward of cells between the sclera and iris in the same manner that Knapp considered apparent in his fourth example; sarcoma cells appear to have infiltrated the iris. Specially noteworthy is the fact that the growth sprang from the injured sclera, which was apparently unruptured; patient continued well after 4 years.
11	Vose Solomon, Trans. Ophth. Soc., vol. ii, p. 263	F., 22	R.	Pain for 18 months in eye and side of head	A reddish smooth growth projected into the anterior chamber through an irido-dialysis; with the ophthalmoscope the growth was seen to spring from the ciliary region; eye removed	Inner	Fingers at 4″	By Priestley Smith. A pale pink tumour, size of a common nut, attached to the inner surface of the sclera in the ciliary region; a small offshoot projects into the anterior chamber, causing an irido-dialysis; lens pressed outwards. Tumour originated in the ciliary muscle; retina separated; growth consists of masses of unstriped muscular fibre with delicate spindle-cells and rod-shaped nuclei; it is a myofibroma.
12	Wecker, Traité de Maladies du	M., 41	L.	Curious appearance noticed in eye for 6 months; V. failed;	A brownish-red tumour is seen projecting into the anterior chamber through	Directly inwards	Fingers	By Iwanoff. A rounded growth size of a small nut kernel springing from the ciliary muscle, pressing against and

				res, then De Wecker	with dilated and tortuous anterior ciliary vessels; tumour can be seen with ophthalmoscope deep in the fundus; separated retina			separated retina; the point of growth is from a comparatively narrow base, the rest of the eye being perfectly healthy; microscopically, cells identical with normal ciliary muscle-cells; patient remained well.
13	Mules, Case-book	M., 12	L.	T. B. ruptured sclera upwards ciliary region; lens escaped: V. ½ normal with lens; some months after warty growth came; removed by Windsor; again appeared and removed; recurred; Mules removed eye	Directly upwards there was a scleral rupture through ciliary region, carrying iris into wound; round edge of rupture then presents a growth papillated, and in connection with ciliary body measuring 5·8 × 3·8″; eye, red and painful, was removed; two large tortuous vessels on growth	Upwards	Half normal with lens	By Dreschfeld. An irregular papillated growth 5·8 × 3·8″ is seen at the upper segment of the corneo-scleral margin, having its point of attachment in the ciliary body (muscle); it consists of round- and spindle-cells, the spindle-cells being few; it is a sarcoma.
14	Mules, Case-book	F., 38	R.	E. B. found sight fail 4 months; 1 month before admittance she noted yellow spot in anterior chamber; evidently the tumour; no history of cancer	Directly inwards there was an irido-dialysis, projecting through which was a brownish mass with vascular points; through the pupil a rounded non-vascular tumour is seen; no separation of retina; disc hidden; T. normal (see Mules' case in body of Memoir: Appendix)	Directly inwards	Fingers; field lost inwards	By Brailey from section cut by Harris. A rounded tumour size of small nut-kernel, pinkish in colour, but nearly white on section; originating in the ciliary muscle it has caused absorption of a segment of the lens; cells spindle-shaped, with small central nucleus; Brailey considers it a true myoma; Dreschfeld and Harris class it a sarcoma.
15	Doubtful, Mules, Case-book	F., 35	L.	A. M. came to the out-patient department, November, 1886, with a small growth, &c.; iris base directly inwards	A small reddish growth no larger than a No. 6 shot is seen at the base of the iris; so far as can be seen it is between the iris and sclera	Inward	Normal	This patient never reappeared. Undoubtedly a growth is present with all the appearance of the earliest stage of ciliary tumour in its anterior muscular fibres. I fear the interest expressed in her case prevented her reappearance.

Case.	Author.	Sex and age.	R. or L.	History.	Appearance of growth and eye at date of removal.	Locality.	Vision.	Pathological examination of.
16	Hirschberg, pamphlet from Real-Encyclopedia der gesammten Heilkunde	F., 57	R.	A scratch on eye before noticing any interference with vision, then found a visual disturbance; V. = shadows	An irido-dialysis, through which protrudes a reddish-brown tumour into the anterior chamber; there was a congested patch of sclera below with large vessels; through the pupil the growth is seen in contact with and pushing up the lens; the T. is increased to + 2; retinal separation only at back of tumour	Down	Shadows	Hirschberg. After section a pigmented tumour is seen projecting directly forward and upward, springing from a broad base directly from the ciliary muscle; the growth is 12 mm. in height; iris attached by inflammation to front of tumour; vessels dilated; no thickening of walls, but endothelium intensely pigmented; tumour consists of round- and spindle-cells; nerve excavation.
17	Hirschberg and Binnbachen, Centralblatt f. January, 1884.—This second case of Hirschberg's I am unable to abstract.							
18	Fano, Union Méd., 1865, N. 59	F., 10	L	Disturbed vision for 4 months	Anterior chamber with growth projecting through an irido-dialysis; eye removed	Not given	0	A spindle-celled ciliary growth projecting towards the lens; the choroid not involved; the growth was non-pigmented.
19	Scheiss-Gem., Kranke Augen in 30 Bildern, Basel, 1876	M., 21	L.	Seven weeks since iron chip struck eye outwards; swelling perceived for 3 weeks	A swelling visible at the outside close to cornea; an epibulbar growth, 10 mm. diam.; eye removed	Outwards	$\frac{4}{1000}$	A very small intra-ocular growth, 5 mm. wide, communicating with the extra-ocular swelling. This is a very doubtful case.—(Author.)
20	Adams, Lancet, 1879, vol. i, p. 511	F., 13	L.	Two small nodules at the ciliary edge of the iris outside and below	Eye removed; T. normal	Out and down	$\frac{20}{60}$	This case was probably syphilitic, although antiseptic treatment was tried; the cells were apparently inflammatory, being small and round.
21	Graefe, Alfred, Klin. Monats., vii B., p. 161, 1869	F., 53	R.	Vision poor for more than 2 months	Iris pushed forwards at the outside; T. normal; eye removed	Out	$\frac{4}{60}$	A tumour size of a hazel nut projecting from the ciliary region; separation of retina below; growth consisted of round- and spindle-cells; recurrence and death in 2½ years.

	Knapp, A., vii B.,ii Abth., p. 301, 1868	23		18 months	the pupil behind the lens; T. normal; field contracted; eye removed		given	absorbing the whole portion of ciliary muscle, whence it originates.
23	Schleiche, Mitt. aus der oph. Klin. in Tub. Herausgegeben, von Nagel, Tübingen, 1880, p. 143	F., 18	L.	Vision disturbed for 6 months	A growth presents through an irido-dialysis to the inside; iris pushed to centre; T. normal; eye removed	Inside	$\frac{5}{60}$	A growth of 3·8 mm. × 7·6 mm.; originates from the ligamentum pectinatum to the inner side of the eye; a portion of lens absorbed by pressure of growth; the tumour is a sarcoma; form of cells not given; no recurrence.
24	Quaglino e. Manfredi, Ann. d'Ottal. in 1874, 1—3 Heft	M., 63	R.	Visual disturbance for 4 years; eye enlarged for 2 years	A large ciliary staphyloma; eye removed	Below	0	A spindle-celled tumour is seen occupying a quarter of the bulbar space; appears to originate from ciliary body (but position doubtful from report); retina separated.
25	Hulke, Oph. Hos. Repts., vol. iii, p. 279, 1860	M., 33	R.	Cornea cloudy; epibulbar growth	Eye removed	Outwards	—	A growth absorbing ciliary body, and apparently in connection with the epibulbar growth (character of cells not given).
26	Hasner, Prager med. Wochenschrift, 1864, No. 49	M., 34	L.	Fifteen years ago hurt by a stick; since 2 years cataract and pressure; since 5 months black knot at corneal edge	Glaucoma and epibulbar tumour at site of accident; eye removed	—	0	A growth is developed at the ciliary point corresponding to the scar from the accident, and in connection with the epibulbar growth; it is 1·5 mm. × 5 mm.; retina separated (cell character not given).
27	Ammon, Deutsche Klinik, 1852, No. 14, p. 159	M., 50	R.	—	An irido-dialysis downwards; brown tumour projecting into anterior chamber; an epibulbar growth bleeding freely in connection through sclera; died from recurrence	Down	Perception	A sarcoma doubtless as patient died from recurrence; cells not noted.

'Oph. Hos. Rep.,' vol. xi, p. 404, Hulke's case.

'Journal of Ophthalmology,' iv—ix, p. 315. Alt, America, one case.

'Annales du Laboratoire de l'hospice national des quinze-vingts,' tome i, fasc. 1, 1888; one case.

Graefe, Halle, one case, unpublished.

Snell, one case, unpublished.

Emrys-Jones, one case, doubtful, still existing.

SUMMARY OF TABLE.

At the commencement of the paper the structure of the growths was indicated.

Of the 27 cases here collected, and of which we have notes of the microscopic appearance, we have 2 myomas, 1 transition tumour, 6 mixed, round, and spindle, 10 spindle, 8 not determined. Of these an irido-dialysis was seen in 12, and 1 case (15) doubtful.

Position.—Inwards in 6, directly down in 5, down and out in 6, up and out 1, down and in 1, out 4, directly up 2 = 25.

Retinal separation difficult to determine as some have doubtless separated by chemical reagents.

Recurrence of growth not worth noting as so few are recorded.

Sex.—17 females, 9 males, one not recorded. Note excess of females.

Age.—Eldest 73, youngest 12.

(*March 8th,* 1888.)

Mr. Hulke spoke of the great value of Mr. Mules's communication, of the difficulty of diagnosis in very early stages, and mentioned a case recently occurring in his practice at the Royal London Ophthalmic Hospital, for particulars of dissection of which he referred to the Curator (Mr. Lawford). In connection with the occurrence of solid new growths in the ciliary region he referred to the fact that cysts also arise there, and passing forward into the anterior chamber simulate in their later stages the cysts originating in the iris.

Mr. Simeon Snell had had two instances occurring in his practice of ciliary tumour. One occurred in a woman aged about sixty-five, and the other (pigmented sarcoma) in a man aged seventy-four. This latter case was seen to be alive and well at the end of three years. He should be pleased to give Dr. Mules particulars of these cases to incorporate with those he had related.

2. *Sarcoma occurring in an eye operated upon by sclerotomy for glaucoma.*

By Simeon Snell.

John W—, æt. 42, from Wombwell, near Barnsley, an underviewer at a colliery, came to me first on March 25th, 1883.

For a long time he had experienced a mist before the right eye, and for the two months previous had suffered pain, which at times was very severe. The surface of the eye was injected, and the cornea was steamy looking. The turbidity of the media prevented a clear view of the fundus. Tension was + 2. V. = $\frac{20}{50}$; and he read J. 1. The field of vision was defective towards the nasal side. To-day he was more free from pain than usual; it came on in "attacks." Eserine was prescribed.

He returned on March 27th, with the pain very violent.

Sclerotomy was performed above. Wecker's knife was employed, and this being sharp only at the extremity, and a little distance on either side, only a puncture and counter puncture corresponding to the width of the sclerotome were made. The situation was the usual one.

Relief to pain was immediate. He returned to the country in two days.

April 5th.—V. = $\frac{20}{30}$; no pain; tension much reduced, perhaps Tn.

May 7th.—V. = $\frac{20}{30}$.

July 20th.—V. = $\frac{20}{20}$ + T.?

August 18th.—V. = $\frac{20}{20}$ + T.?

He remained well up to latter end of 1885. Pain had ceased, and the eye had given him no uneasiness. The outside congestion had disappeared, the pupil remained somewhat dilated. Atropine had been prescribed before he came under my notice, and he was in fact using it when first seen. This, it was then thought, had aggravated

the glaucoma. The case was peculiar in that such an acute attack should not be accompanied with more impairment of sight. The lens to the unaided eye always appeared somewhat whitish and opaque, yet it was clear, and all this time a good view of the interior of the eye was obtainable. Beyond excavation of papilla there was nothing to note.

In January, 1886, he came to me in consequence of two small lumps appearing, one at the seat of puncture and the other at the place of counter-puncture for sclerotomy. He was suffering some amount of pain. Tension was increased. Vision was worse, but still he could see fair sized letters by turning the eye outwards. The surface of the eye was coursed over by some rather enlarged and tortuous vessels, especially above. The "lumps" had, he thought, gradually come on. Eserine was prescribed, and with the use of this and a compressive bandage the staphylomas gradually subsided.

He resumed work, but he says that pain never really left him during the whole of this year. In September he again came to me; the pain was severe. Eserine again did some good, and warm poppy fomentations were also of service.

Again, at the end of December 27th (1886) he consulted me. This time the appearance had quite altered. He had been using eserine without relief. In addition to the protrusions at the seats of the sclerotomy punctures, there was a larger and more diffused enlargement above. It was separated from the one on either side by a marked depression. The surface of the eye was coursed by several enlarged and tortuous vessels. Tension was decidedly plus. The lens was more opaque, and no view of the interior was now obtainable.

He still saw large letters by turning the eye very much outwards. Pain was very great.

December 30th, 1886.—The sclerotic was punctured in the outer side below. The immediate relief was distinct, and it was thought the various enlargements on the

sclerotic became somewhat smaller during the next few days.

January 22nd, 1887.—The relief experienced by the puncture of sclerotic soon passed away. Pain has returned. The lumps, especially the one beyond the upper margin of the cornea, have increased in size. The movements of eyeball are impeded. Vision is just the same. The sclerotic was punctured through the protrusion above; sanious fluid, very little, escaped.

Increase in the size of these excrescences still occurred, and the movements of the eyeball became further interfered with.

It appeared clear that the growth in the eyeball was rapidly growing. He had been very disinclined to submit to enucleation, owing to the vision still possessed, and to which he was desirous of clinging. Now, however, he yielded to advice given, and on February 16th, ether being administered by my colleague, Dr. Porter, removal of the eyeball was performed.

The protrusion from the sclerotic above was found not only to invade the anterior part, and to reach now close up to the cornea, but to stretch to the back close to the optic nerve. Along the outer part of the sclerotic behind were also several nodules. The optic nerve was severed as far back as possible, any portions of growth detected in the orbit, or any suspicious pieces of conjunctiva after excising the globe, were removed with scissors. I regretted not having any chloride of zinc paste ready for application, but I confess I had seen no reason to apprehend such a condition at the back of the eyeball.

On examining the globe the projections of the sclerotic on either side of the upper part of the cornea were noticed to have almost merged into the larger one above, a little depression only separating them. The enlargements above reached from near the cornea to close up to the optic nerve entrance, outer side. Besides these were nodules as large as horse-beans attached to the back of the sclerotic on the outer side of the optic nerve. The

tumour and eyeball were subsequently hardened in Muller's fluid and bisected when frozen. The sections exhibited have been mounted in glycerine jelly (Priestley Smith).

The section has been made from above downwards. The eyeball is nearly filled with the growth, except below for a small space. The sclerotic is seen to have been per-

forated about midway between the cornea and the optic nerve entrance. The extension of growth lies on the selerotic, reaching, as before said, from the cornea close to the back of the eye. Behind, external to the optic nerve entrance, is another perforation.

The patient recovered well from the operation for removal of eyeball. All went well. There was no return. About the 5th of July he came to me with distinct evidence of growth at the back of the orbit. Three or four weeks before the orbit was examined and no recurrence detected.

July 8th.—He was admitted into the Sheffield General Infirmary. On the 10th, ether was administered, the contents of the orbit were cleared out, and chloride of zinc paste freely applied. The recurrent growth was about the size of a walnut.

Up to the date of reading this no relapse has occurred. He wrote recently saying he was quite well and pursuing his avocation.

August, 1888.—The patient was seen a short time since in perfect health, and no sign of recurrence. The left eye has throughout presented no glaucomatous symptoms or other abnormal condition.

Mr. F. Boynton-Lee kindly undertook the microscopical examination for me. He reported as follows :

Under a Low Power ($\frac{1}{2}$ *inch*).

Section appears fasciculated and somewhat lobular with the outer edge in some places of connective tissue.

Sections of blood-vessels seen, which appear either as empty spaces running in various directions or as longitudinal or round collections of greenish-coloured cells (stain picro-carmine). Occasionally is seen what is evidently an extravasation of blood, told by the irregular margin, and a larger collection of these same greenish-coloured cells (blood-corpuscles) in the smaller ones or in the larger ones by the picric acid stain. These do not, however, appear to be numerous.

Under a High Power ($\frac{1}{6}$ *inch*).

The cells composing the bundles are of a spindle shape, and when seen singly seem approximately to be about from $\frac{1}{300}$th to $\frac{1}{500}$th of an inch in length, and from $\frac{1}{2000}$th to $\frac{1}{3000}$th of an inch in diameter. Many of the cells are cut transversely, and look like round-cells with or without a nucleus, according to position of the section. The blood-vessels have no regular structure, unless it is in some places that the cells are grouped a little more closely at what would correspond with the walls of the same.

Diagnosis.—Small spindle-celled sarcoma.

(*March 8th*, 1888.)

Mr. Hulke inquired whether it was not possible that the sarcoma might have begun before the inception of the glaucomatous symptoms, remained latent for a time, and then, later, rapidly enlarged ?

Dr. Mules remarked that it was in just such a case as Mr. Snell's that the "light beam" showed its value, for if it had been used the existence of an opaque growth at the seat of the sclerotomy would have been demonstrated beyond dispute.

Mr. Snell, replying, said that if the growth had existed anteriorly to, and in fact occasioned the glaucoma, it must at that time have been very small, and have been completely out of the way of observation, for on several occasions the interior of the eyeball was carefully examined and no sign of anything morbid, beyond the cupping of the papilla, was discovered. Perhaps the careful microscopical examination which had been promised might shed some light on this point. He thought, however, that the sarcoma had developed subsequently to the sclerotomy. The other eye had never shown any signs of glaucoma, and was in every way a good organ. He had used chloride of zinc in many instances, and thought it use was most valuable. He had never seen any danger result.

Report upon Mr. Simeon Snell's Specimen.

The inner lateral half of the eyeball and new growth were handed to me. I have carefully examined the specimen in both its macroscopic and microscopic characters, and have to report, briefly, as follows:

The growth is a mixed round- and small spindle-cell sarcoma, unpigmented, and of moderate vascularity. It has infiltrated and destroyed most of the structures in contact with it. While I cannot speak positively of the exact site of origin of the tumour, it is most probable that it began in the choroid at the upper part of the eyeball. From this point it extended anteriorly through the sclerotomy wound into which the ciliary processes, or what remains of them, have been carried; posteriorly along the choroid coat, eventually perforating its lamina elastica, and filling the vitreous cavity, and making its way

through the sclerotic at the equator above, and close to the optic disc.

At the lower part of the eyeball the growth is *inside* the choroid coat, and therefore did not originate at this part.

Quoad the date of origin of the growth, whether before or after the performance of sclerotomy, microscopic examination in no way helps to a decision.

J. B. Lawford.

VI. DISEASES OF THE IRIS.

1. *On iridectomy for recurrent iritis.*

By E. Nettleship.

The subject of iridectomy in the treatment of iritis and its results has been before us for so long, and there are so many signs that as a means of preventing recurrences of inflammation the method is in less favour now than it was some years ago, that in bringing so commonplace a subject here I feel that some explanation is due. Briefly, having found considerable difficulty in making up my own mind I am hoping to learn much from the experience of the surgical members of this Society.

We of course all know that iridectomy in the treatment of iritis was introduced by v. Graefe expressly in the belief that recurrences were due principally to the presence of adhesions,* and that the operation acted in some such way as to prevent this their deleterious effect. Although v. Graefe's dictum is still adhered to almost literally by the author of one of the best known and most widely read foreign ophthalmic handbooks, it will, I believe, be conceded that since v. Graefe's time there has been a marked revival of the earlier belief that the clinical peculiarities of the different forms of iritis are due more to constitutional than to local causes. Nearly all will, I suppose, admit that the iritis of secondary syphilis shows but little tendency to recur, whether permanent synechiæ be left

* "On Iridectomy as a Means of Treatment in Chronic Iritis and Irido-Choroiditis," translated for the New Sydenham Society from the 'Archiv f. Ophthalm.,' Bd. ii, 1856.

or not; and that, on the other hand, there are forms of relapsing inflammation of the ciliary region which in general behaviour closely resemble genuine recurrent iritis, but in which the iris escapes, or is but slightly implicated. Whether, however, we believe that recurrences of iritis are due chiefly to constitutional causes, and especially to some form of rheumatism, or to the local effect of iritic adhesions, our doctrine can have no effect on our practice if it can be shown clearly that iridectomy does, as a matter of fact, prevent the attacks.

One must, of course, begin by defining his position as far as possible, and recognise, as has just been implied, that the group of recurrent or relapsing iritis comprehends several sub-groups, which differ considerably from one another in clinical features and pathological results, and probably also in cause. Thus, whilst the type is the common acute form with adhesions;—we can hardly exclude, on the one hand, certain forms of acute relapsing disease in which most of the usual symptoms and signs of iritis are present, often with great pain and congestion, but without the formation of adhesions, or at the most only slight ones (neuralgic relapsing "iritis" or perhaps "scleritis"); nor, on the other, the larger group of genuine iritis and irido-cyclitis, in which the tendency to relapses is expressed by the vacillation, rather than the temporary cessation, of the active symptoms, and in some of which there is little, in others much, structural result of inflammation. The following cases illustrate the non-iritic varieties of recurrent (rheumatic) ocular inflammation (Cases 1, 2, 3, 4, 5).

Case 1.—*Short attacks of recurrent ocular neuralgia with congestion, affecting one eye at a time, in a healthy man of* 35. *No organic changes in eyes. Gouty family history.*

Mr. W—, æt. 35 (P. 12, 31), a solicitor, was sent to me by my colleague Dr. Theodore Acland in November, 1885,

chiefly with reference to attacks of pain in the eyes to which he had been subject for the last two years. He had had several of these attacks near together eighteen months before, then had been free for some time, and lately had been bad again. The R. suffered most often, but sometimes the L., never both together. The attack consisted in severe pain in the eye lasting the whole of one day ; the next day there would be some redness and watering, and then the eye was well again.

He mentioned spontaneously that the pain was made worse by moving the eye. As a rule he could not account for the attacks, but believed that a long day's work would sometimes bring one on. He described the pain as behind the eye and at the emergence of the supra-orbital nerve. He appeared to be a healthy man ; he had bad teeth but had suffered very little from them, and with the exception of occasional stiff neck he had no symptoms that could be called rheumatic. A brother younger than himself had, however, had rheumatic gout, and their paternal grandfather had suffered badly from gout. The patient's sight was perfect. Refraction slightly H., acc. good.

Case 2.—*Short attacks of recurrent ocular neuralgia, with congestion, affecting one eye at a time for many years, and at length causing scleral and corneal changes. Patient an elderly lady. Family history of gout and megrim.*

Mrs. M—, æt. 60 (P. 13, 200), has been subject for more than ten years, to short attacks of bad ocular neuralgia ; since they began she has never been a fortnight free from them. The pain, which never attacks both eyes together, begins like a needle-prick, gets rapidly worse and lasts at the most for one day, often much less ; during the pain the eye gets red. For several years no structural changes seem to have taken place, for she had much advice from specialists and

physicians, and all agreed that there was nothing but "neuralgia." Latterly, however, some permanent changes have appeared; and when I saw her (November, 1886) there was some duskiness of the sclerotic at the upper part of R., a large patch of scleral congestion in a nearly corresponding part of L., and an exactly symmetrical, dense arcus at the upper inner half of each cornea; in the L. this arcus was patchy, and in neither eye was the opacity like common arcus senilis.

Mrs. M—'s sister has gout in the foot, and is subject to a form of megrim headache; her brother and father have also suffered much from megrim.

Case 3.—*Short attacks of recurrent iritis with severe neuralgia confined to one eye, and followed by chronic glaucoma, in an elderly lady subject to rheumatism (or gout) and to diabetes.*

Miss H— (P. 8, 175), æt. 56, extremely nervous and lately much worried, has chronic glaucoma secondary to iritis in the L. Several of her relations have had gout. She herself has had what she calls "rheumatism" in the hands, and suffers from intermittent diabetes. The glaucoma was far advanced when I saw her in June, 1883; V. $\frac{20}{200}$ and 19 J., F. much contracted except outwards, o. d. grey and cupped, a. c. very shallow, T. + 2, P. irregular from adhesions.

The iritic adhesions had resulted from numerous short attacks of inflammation to which she had been subject for about two years. These came on very suddenly with acute pain and redness, and lasted, as a rule, only a day or two; she had had a great many of these, but not a single long attack.

The other eye was quite healthy and V. n.

Possibly thickening of the iris, due to repeated attacks of inflammation, was the immediate cause of the glaucomatous complication; for there was no bulging of iris by fluid, and the p. did not seem totally excluded.

Case 4.—*Frequent attacks of acute painful scleritis without iritis, affecting only one eye at a time, and often only part of the ciliary zone. Patient a middle-aged woman of gouty family.*

Sylvia W— (T. O. P. letters) came in May, 1881 (she was then 52), asking advice about attacks of pain and redness of the eyes to which she had been subject for eight or ten years. Usually only one eye suffered at a time, but on the last occasion, a fortnight before, both had been bad. She said that each attack lasted about a fortnight, and that there was no discharge from the eyes. At the present time she was well, sight was good, T. n., Ps. active, but R. less so than L.

In July she came again with an attack in the L. The congestion was general, but greater in the lower half, and there was a little thickening there; iris rather discoloured, P. and T. n. There was much pain at times; ten days later L. was well and R. bad, the congestion in it being chiefly of the upper and inner part; this eye also was very painful. This whole attack lasted five weeks. The pain seems to have come very irregularly, and when it occurred it was very severe.

In October a short attack occurred in R. Early in December the L. suffered for about a week. A month later the R. for a few days. Six weeks later still (February 14th, 1882) a brief attack in L. She was then well until early in June, when L. went through a short attack at the inner half. In September the inner part of both eyes was inflamed, and she was under care on and off for six weeks. Seems then to have been well until April, 1883, and after that until June of that year, since which time I have not seen her.

She was a pale woman suffering from piles, but not otherwise in bad health. She had once had what she called rheumatism in one side, and she said that her eldest brother suffered mildly from gout; she had never had ague. She could not assign any cause for her eye

attacks, and did not think they were brought on by cold. At different times she took iodide of potassium, salicylate of soda, quinine, and saline purgatives. She always used atropine, had a great many blisters, and protected the affected eye with dry, warm pads. I am not clear that any of the treatment helped her much. Neither the iodide nor the salicylate, however, was pushed, and aconite was not tried.

Case 5.—*Relapsing symmetrical conjunctivitis, affecting only part of each eye, in a young man who had had severe articular rheumatism.*

Chas. V—, æt. 21, a billiard marker (M. O. P. 1, p. 147), came in May, 1884. There was bright red congestion (conjunctival) of both eyes, most intense at a distance from the cornea, and not affecting the whole circle. Thus in the R. a large sector at the upper and outer part was quite clear and pale, and in the L. nearly one half in the lower and outer half was also clear. The congestion was of scleritic type; there was no discharge. Ps. natural. The attack had begun four days before; he had been out driving all day, and in the evening felt some smarting and grittiness in the eyes, and this was followed by a good deal of pain in the forehead. The eyes were well within ten days of the onset.

He had had four similar attacks; the first, five years previously, and about one each year since; they generally occurred in spring. He thought it due to the bright sunlight. He had lived partly in Norfolk and partly in London during this time, and climate did not seem to affect him. The attacks generally lasted about a fortnight and were accompanied by pain in the temples.

A year before I saw him, and after he had had several of his ophthalmic attacks, he was laid up for four months with "rheumatic fever," all the large joints being affected. He denied venereal disease.

It is quite possible that iridectomy may be useful in

some forms of relapsing iritis, and useless or hurtful in others. In sympathetic irido-cyclitis iridectomy is generally condemned as at least useless, and in the forms of so-called serous and parenchymatous irido-cyclitis, which somewhat resemble sympathetic disease anatomically, though due to different causes, I believe that the operation is seldom useful and sometimes harmful. In almost all of these cases there is keratitis punctata, and I am inclined from personal experience to say that the presence of keratitis punctata in a case of chronic or subacute iritis should usually be taken as adverse to iridectomy. In the following case, for instance, the operation performed twice on the same eye had no effect on the course of the disease, and the colobomata were partially closed by lymph.

Case 6.—*Subacute vacillating double iritis with keratitis punctata in a middle-aged man. No evident cause. Iridectomy twice on one eye. Result negative, or perhaps injurious.*

William A—, æt. 40, a butler, spare, and of steady habits, came under care in May, 1884, for subacute iritis with keratitis punctata in both eyes; in the L. there were many adhesions, and the disease seemed to have begun in it five months before.

After treatment for about five weeks an iridectomy was made upwards in L. The iris was thickened and soft, only a small piece was got away, and the operation did no good. The eye continued in a state of mild chronic inflammation for many months, the coloboma closing up and the dots on the cornea not disappearing. In February, 1885, a second iridectomy, also rather small, was made in the same eye, downwards. Since then the disease has on the whole made progress in both eyes; there have been no sharp relapses, but he is frequently under care for slight attacks, and V. is much impaired in both. The disease in L. has certainly not been bettered by the operations.

Myopic formation of the eye is also, I believe, unfavourable to a permanently good result after iridectomy, though I, of course, cannot be sure that in the cases next to be referred to the results would have been better had no operation been performed. Cases 7, 8, 16.

Disease of the vitreous, apart from the two conditions just named, I am inclined to fear less, but I should like to hear more about this. Case 9 is an instance.

CASE 7.—*Double juvenile iritis and high myopia. Double iridectomy. L. eye lost. R. remaining good for several years, then failing with acute detachment of retina after violent sea-sickness. Strong family history of gout.*

The Rev. L. G— (P. 11, 185), æt. 24, had "iritis" in both eyes several years ago, but whether simultaneously, or with an interval I am not sure. Eventually double iridectomy was done. L. was lost. R. remained good till a few days before he came to me with acute detachment of the retina. The first symptom of this mischief was a "line" or "hair" across the sight, which came on within an hour of his arrival from the Continent, after an exhausting two days' railway journey, followed by severe sea-sickness. Within a day or two the eye was as bad as when I saw him. I saw him eight days after the first symptoms; at that time there was a large grey detachment in the lower half with haze (probably of vitreous), a large upward coloboma, iritic adhesions, T. −2, V. $\frac{6}{60}$ with −8 D. (he had worn −8 D. for several years). He was treated with pilocarpine and rest, but with no advantage, and he retained only a little light on a small spot of the visual field. During the treatment the eye became red and painful for a few days (cyclitis). The L. showed old iritis, small, irregular operation coloboma, secondary cataract, T. n., no p. l.

This patient was a water-drinker, and had had no

arthritis; several of his brothers were myopic. His father suffers from definite gout, his father's mother and her father had all been very gouty; thus gout was well known for three consecutive generations.

CASE 8.—*Chronic vacillating irido-cyclitis in both eyes of a myopic man without apparent cause. Double iridectomy within a year of onset, followed by careful precautions and prolonged rest. No further iritic attacks, but ultimate deterioration from deeper disease.*

The Rev. J. B— (P. 6, 140), a spare, nervous, frail man, liable to bronchitis, and looking older than his years, but giving a good family history. Without any known cause iritis began in L. during the summer of 1881, when he was 46; six months later he saw Sir William Bowman, when both eyes were somewhat affected, the L. being the worst. Under treatment L. became quiet, with much damaged vision, but inflammation recurred in R. six times between January and May, 1882. There was never severe pain or strong congestion, but during the attacks the sight became very bad, and improved again between times. He had been short-sighted for some years. In May, 1882, I found that R. was just recovering from an attack; mild ciliary congestion, P. sluggish and irregular, T. n., a cloud in lower and outer part of cornea, details of fundus not seen, V. with -4 D. $\frac{6}{36}$. L., whitish iritic adhesions, T. n., iris flat, V. less than $\frac{6}{60}$.

At the recommendation of Sir William Bowman, who sent the patient to me, I performed without delay a small iridectomy upwards in each eye. The patient went home shortly afterwards with careful directions against use and exposure of his eyes, and instructions to employ atropine if an attack were threatened (he had observed that atropine always relieved discomfort during an attack).

In June, 1883, the eyes were quiet, colobomata clear,

and no relapse had occurred; R. with − 3 D. sph. and − 2 D. cyl. V. = $\frac{6}{18}$; L. could not see $\frac{6}{60}$ with any glass. Large films in each vitreous, a moderate crescent at y. s. side of each o. d., no choroiditis.

By taking the greatest care he got on pretty well till the autumn of 1885, when R. (the better eye) failed. In April, 1886, I found it inflamed, with haze of lower part of cornea, vitreous very muddy, V. (corrected) $\frac{6}{60}$. L. quiet and as before. To use blisters and atropine.

In March last (1887) Dr. J. D. James wrote that Mr. B—'s sight was decidedly worse, and that he had been much out of health from bronchitic asthma.

In June I found that "eyes have been quiet since a batch of blisters were used after visit to me in spring of 1886;" but V. of R. still deteriorates, and is now barely $\frac{6}{60}$. No opacity of corneæ or lenses, and no disease can be proved except the opacity of vitreous.

In this case no further mischief occurred in the better eye for about three years after the iridectomy; then fresh effusion seems to have taken place into the vitreous, and later the eye again inflamed. The L. has remained unaltered from the date of operation. Mr. B— took very much more care of his eyes after the operation than before, and I feel by no means confident, therefore, that the temporary arrest of the disease in R. should be credited to the iridectomy.

Case 9.—*Iridectomy for vacillating juvenile (? gouty) irido-cyclitis of several years' standing in one eye; disease of vitreous but no keratitis punctata. Marked relief after operation. Condition two years later.*

In the case of Mr. C— (P. 6, 56), a medical student, iridectomy, resorted to after several years of treatment, and performed during an attack, aggravated the disease for a short time, but has been followed by greater immunity than he had ever known. His eye disease, limited to L., dates from the age of about ten, when he had a

blow on the eyelid with a pebble. From that time he became liable to numerous little attacks not lasting more than two or three days, not accompanied by pain ; the R. never suffered. He had had no venereal disease, but had once had rheumatism with much swelling in L. knee, and had had a similar attack in R. wrist just before I first saw him. His father had had rheumatic fever as a young man. I first saw the patient in January, 1882, at the age of nineteen ; the iritis was mild, no permanent synechiæ being present, but there was much opacity of vitreous and some diffuse retinitis. Atropine always irritated, but he was able to use duboisin sparingly without discomfort. In March an attack, chiefly located over the internal rectus tendon, occurred ; and during the year he had two or three others, once with a small hypopyon ; he also again had "rheumatism" in R. wrist and foot. During the next four years the eye was very often troublesome, iritic adhesions gradually formed and he got through very little work. At the end of August, 1886, as a rather bad attack was passing off, I performed iridectomy. Within ten days of the operation a rather severe relapse occurred with hypopyon, and subsequently bleeding into a. c., and the eye was not well till October. Since then, however, though the eye has been threatened a little from time to time, it has given him very much less trouble than before.

July, 1888.—He has been free from all except slight threatenings for two years, and lately has done a fair amount of reading.

On the other hand, cases of chronic or subacute iritis or irido-cyclitis with circular (not total) synechia and bulged iris, often react well to operation even if the iris be thickened and tough, provided that a large piece can be removed ; in these there is, as a rule, no keratitis punctata.*

* This statement refers to the condition at the time when iridectomy is in question. Probably in some of the cases referred to keratitis punctata may have been present earlier.

In these forms of disease, however, the question is not that of preventing acute, well-defined, painful relapses, but rather of arresting the course of a slowly progressive, though varying, malady.

In the group of ordinary acute relapsing iritis, it seems to me that, though the operation seldom does harm, there is more difficulty than in the quieter forms last referred to, in predicting that it will do good. I think that the instances in which the disease relapses almost as much after iridectomy as it had done before, are so numerous that we are compelled to doubt whether the immunity which the operation has appeared in some cases to confer, has been genuine. This doubt is strengthened when we observe that cases of common recurrent iritis show wide variations, alike in the length of the inter-iritic periods, and in the duration and severity of the attacks, and that in some of them the disease shows a tendency to become spontaneously less and less severe as time goes on.

The following cases illustrate most of these statements. One of them (Case 16) proves further that ciliary inflammation may occur and relapse many times, in the most typical manner, in eyes upon which iridectomy had been done some years previously for artificial pupil in lamellar cataract. It is worth noting that in several of the cases (13, 14, 15,) in which a long period of freedom followed the first attack of iritis, the subsequent attacks, which were placed much nearer together, came on soon after the commencement of the presbyopic age ; possibly overwork of the ciliary muscle, due to want of glasses, may have been a factor in exciting these recurrences.

Case 10.—*Iritis relapsing severely soon after iridectomy had been performed in the second attack. Patient gouty.*

Mr. W. J— (P. 10, 168) came for advice because iritis had lately relapsed in his R. soon after an iridectomy had been done, almost under the promise, as he understood, that the operation would prevent further attacks.

He was (January, 1885) aged 36 years; the family history not full, but his brothers and sisters are said to be gouty. He himself has been a free liver, drinking champagne, port, and beer, and for eight years has been subject to "rheumatism or gout" in the right great toe and in the muscles of the thighs. Has had gonorrhœa several times, but there is no clear relation between this and the arthritis. In September, 1883, he had iritis in R. eye whilst in Scotland, and made a good recovery in six weeks. In May, 1884, the eye again inflamed; there was said to be increase of T. and pus in the a. c., and towards the end of July iridectomy was performed. Early in December, 1884, there was a third attack in the same eye, which lasted a month or more. When I saw him on January 17th, 1885, the eye was quiet with numerous iritic adhesions. The attacks have always come on very quickly without the slightest warning, the eye being quite well in the fore part of the day and badly inflamed by evening.

Case 11.—*Iridectomy during the second attack of severe iritis in L., with relief to pain and inflammation, but no lasting preventive effect. Three relapses in operated eye and two in non-operated eye within the next six years.*

In the two following cases the operation seems to have had no effect. Mr. K— (M. O. P. papers), a plethoric publican, had his first iritis in L. when about 35. The second attack, at 37, was in the same eye, and after lasting some months got well soon after a satisfactory iridectomy. The next two attacks were in R., and at this point the case seemed to be one in which operation had stopped relapses in L. But at the age of 41 (August, 1883) a severe relapse occurred in L., a year later another, and in December, 1885, another; these attacks lasted three or four weeks and were severe as regards pain and congestion; the aqueous was always

muddy, but there was no bleeding or suppuration. No note as to syphilis or arthritis, but case headed "rheumatic" iritis.

Case 12.—Wm. C—, (T. I. P., 1879, 1887, &c.). *Very numerous attacks of iritis in each eye singly, beginning, at age of* 25, *two or three years after prolonged general gonorrhœal rheumatism. Iridectomy in the worse eye about ten years after first attack* (*æt.* 36), *with little if any effect in preventing relapses, which continued to occur as often in the operated as the non-operated eye. Gradual lessening in severity of attacks in each eye, with slow formation of cataracts. No rheumatism after the original attack. Nearly thirty years after onset of iritis, cataract extracted from eye in which iridectomy had been done; good result, followed in about two years by detachment of retina. Attempted extraction of cataract in other eye* 1887 (*æt. about* 55), *but vitreous fluid and lens fell back and could not be removed.*

Case 13.—*Iritis in one eye, and gout, at age of* 31. *No iridectomy. Frequent recurrences of gout but no other attack of iritis for twenty-two years, when second attack in same eye. Third attack* (*in other eye*) *after a much shorter interval.*

William H— (T. O. P. papers), assistant to an auctioner, had an attack of inflammation in the L. eye when he was 31, the R. not suffering. At the same time he had his first attack of gout. Although he had gout usually every spring afterwards in the great toe and elbow, he had no inflammation in the eye for the next twenty-two years, when he had a second attack; about two and a half years later he had an attack in the R., and was sent to me by Dr. Newth shortly afterwards. He was then (November, 1886) 56, still subject to mild attacks of gout without tophi or urinary symptoms. He denied ever having had any general disease. Both eyes

were quiet; the L. showed numerous adhesions and the pupil nearly blocked with pigment, V. proportionate to the condition, iris flat, T. n.; in the R. slight adhesions, V. good, and no complication except M. of 1 D.

If iridectomy had been performed on the L. for the first attack, the twenty-two years of immunity would naturally have been ascribed to its influence.

It is not unlikely that the two subsequent attacks, which did not occur until after the age of 50, were partly excited by over-strain of ciliary muscles, for he had not hitherto worn reading glasses. I ordered him spectacles + 1·5 D., and deferred the question of operation.

Case 14.—*Iritis, probably double, at age of* 36. *Iridectomy on the worse eye. Both eyes free for next nine years, when a relapse occurred in the non-operated eye. Tendency to relapse evidently slight. Chronic rheumatism.*

William H— (T. O. P. papers), carpenter, states that he had inflammation of both eyes when 36, and at the same time became subject to chronic rheumatism, which still affects him chiefly in the shoulders. He went to Moorfields, where iridectomy was performed on the R.

As the L. was not operated on, we may assume that it was suffering less severely. A second iridectomy was made on the R. some time afterwards at another hospital. Both eyes seem to have remained free from attacks for nine years till he was 45, when a moderate relapse occurred in the L. (non-operated eye), for which he came to me in July, 1882. He said he had never had any venereal disease, and that he knew of no gout in the family.

There can be no reasonable doubt that the operation was done on the worse eye, and we may fairly attribute its immunity for the next nine years to the iridectomy. That the non-operated eye also escaped for so long, how-

ever, may be taken as evidence that this man's tendency to relapse was not very strong.

It is of interest to note that in the operated eye there were numerous opacities in the lens, apparently between capsule and nucleus, but with a less defined border than in ordinary zonular cataract;* the cataract was probably the result of the iritis, and he believed V. of this eye to have been perfect till the attack.

Case 15.—*First attack of iritis in R. at age of* 39; *iridectomy; free for nine years. Then first attack in L.* (*at age of* 48); *iridectomy. Severe relapse in R. twelve years after its first attack, and subsequently several mild relapses in L. The relapses perhaps due to uncorrected presbyopia. Effect of iridectomies probably negative.*

Charles H—, labourer, married (T. I. P., 1879, p. 126), had his first iritis in R. when he was 39; iridectomy was performed. He had no trouble in either eye for the next nine years, when the L. (non-operated eye) inflamed for the first time and had five or six attacks between that time and his coming to St. Thomas's Hospital in November, 1879. He was then 48, and suffering from severe iritis in L. (non-operated eye), with hypopyon and gelatinous exudation into the a.c., several adhesions, moderate congestion and pain, T. n.

With the history of R. before me I performed iridectomy on L. and the eye did well. Subsequent events raise much doubt whether the freedom of the eye first attacked (R.) was due in any important degree to the iridectomy, and whether my operation (on L.) has been useful. Since I first saw him he has been to me for an attack in R., the first eye, with hypopyon and severe symptoms and + T. (June, 1880). This was about twelve years after the first attack. He has also had several

* Compare v. Graefe's statement that he had seen lamellar cataract follow iritis (loc. cit., Translation, p. 271).

attacks (mild, it is true) in L. since I operated on it. T. in both eyes has been left somewhat below par. The case is headed "rheumatic," but unfortunately no details are noted. I last saw him in 1883.

It is worth noting that a special liability to relapse in these three cases (13, 14, 15) seems to have come on at about the commencement of the presbyopic age.

Case 16.—*Iridectomy on each eye for lamellar cataract at the age of 22; high myopia. Attacks of ciliary inflammation setting in nine years later, recurring frequently and leading eventually to loss of one eye from detachment of retina. Gout in family.*

In the case of Mr. W— (P. 13, 213), iridectomy for lamellar cataract at the age of 22 did not prevent relapsing inflammation nine years later; half-a-dozen attacks, each lasting six or eight weeks, occurring in about two years, when he was about 32. Only one eye suffered at a time. Later (age 36) the R. again inflamed and became rapidly blind with detachment of retina and continued to suffer from attacks of inflammation until I saw him at the age of 39. At that time the L. also had had a recent attack. I found a good coloboma and lamellar cataract in each, and no obvious results of previous iritis. With L. he could read small print held close, and he wore − 6 D. for distance. He had lately been advised to have L. lens removed, but I dissuaded him from the operation.

Making every deduction, however, for such sources of error as have been illustrated by the foregoing cases, and allowing also for the proneness of patients to attribute benefit to any active treatment, I feel little doubt that iridectomy does confer real good in some cases of iritis; and this, whether the operation be undertaken during active inflammation or in the interval between two attacks. The benefit sometimes takes the form of a

very long term of freedom, sometimes of an increase in the length of the inter-iritic periods, sometimes of a diminution in the severity of the attacks. Of these assertions the next cases (17, 18, 19, and 20), are given in evidence.

CASE 17.—*Numerous attacks of iritis in both eyes between 40 and 43 years of age. Double iridectomy. Complete freedom for about fifteen years. Gout.*

Charles P— (T. O. P. IV, 161) became liable to attacks of inflammation of the eyes when about 40, and had about one every three months for the next three years; usually both eyes suffered, but L. more than R.; there was much pain, redness, and intolerance of light. After enduring for three years he submitted to double iridectomy, and has since not had a single attack either of pain or inflammation. When seen, aged 56, August, 1884, examination showed in the L. iritic adhesions, M. about 3 D. myopic crescent, and some haze of lens, T. n. V. $\frac{6}{36}$ and 1 J.; in R. there was only p. l., and the lens had become nearly absorbed. Patient's father had gout, he himself had lately had pain in the great toe, and his eldest son, who was a drinker, had had rheumatic fever, and more recently gout.

CASE 18.—*Iridectomy giving immediate relief to vacillating subacute rheumatic sclero-iritis of three years' standing.*

One of my best cases is that of Dr. C—, who became subject to subacute rheumatism of the large joints at about the age of 20. Some years later he had gonorrhœa followed by rheumatism in the small joints also, but he never had syphilis.

A year before I saw him he had fever badly in Calcutta, having had slight attacks before. Six months before I saw him he got inflammation of R., and about three months later of L. There was much inflammation

of sclerotic and opacity of cornea, but not much iritis. When he came to me, September, 1881, aged about 30, there was scleritis in both, of the variety in which the change consists in congestion, without thickening of sclerotic or episcleral tissue, at a distance from the cornea and extending back out of view. There was a considerable patch of cloudy cornea in each, not at the lower part.

This gentleman remained under my care more or less continuously for four years, his eyes and his joints being sometimes well, at other times very troublesome, and on the whole getting worse. He could not bear much atropine without getting conjunctivitis, and at length, after trying all sorts of treatment, he became so dispirited about his eyes that he very willingly submitted to iridectomy. I confess that I was not sanguine, chiefly because there had been so little structural change in the iris, only one or two adhesions being present in each eye; the result, however, was immediately and entirely satisfactory, and from the time of the operation till his return to India, about a year afterwards, his eyes gave him no trouble whatever, and he has since been able to carry on practice there satisfactorily.

P.S.—The rheumatism in his joints continued as troublesome as ever for long after the iridectomy, but I heard from him (December, 1887) that some time after returning to Calcutta (a year subsequent to the operation) the rheumatism gradually got less, and that for more than a year past it had scarcely troubled him at all.

Case 19.—*Iridectomy and sclerotomy apparently conferring temporary freedom from relapses of iritis, but the effect wearing out.*

Mr. C— (P. 12, 94), now (January, 1886) 65, believes that operation has on the whole increased the intervals between his attacks of iritis; he is, however, so full of fancies and prejudices about all the common remedies for iritis that I distrust his evidence. His eye attacks began

thirty years before I saw him (1856); he said that he had had forty, but I fancy that many of them had been slight. In March, 1869, iridectomy was done on L. by Mr. C—, without effect on the recurrences; in June of the same year Dr. M— did iridectomy on R., and for the next eight years (*i. e.* till about 1877) this eye had no relapses. In 1882 a second operation ("sclerotomy") was performed on L. by Dr. W—, and the attacks in it, which had been frequent, ceased entirely for about three years (till the spring of 1885), though the R. had been subject to attacks all this time (and indeed since 1877).

Case 20.—*Many attacks of iritis confined to the same eye. Iridectomy coinciding with beneficial change of climate. Subsequent attacks of iritis less severe and less frequent. Patient rheumatic and probably gouty.*

Dr. — (P. 14, 63) a naval surgeon, now æt. 50, had neither iritis nor rheumatism till nine years ago. At that time his L. eye inflamed, and he had a long attack of subacute rheumatism in the feet, knees, back and elsewhere, but none of the joints were permanently damaged. "It was not gout and was not gonorrhœal rheumatism." He has not suffered from fever or any tropical diseases.

Since then he has not suffered much in the joints, but the eye has suffered a great deal. During the next four years, when he was on duty alternately in Canada, the West Indies, and Bermuda, he had eight or nine attacks of iritis each lasting from four to six weeks, and all of them in the same (L.) eye.

He returned to England between four and five years ago (about 1882), and very soon afterwards had upward iridectomy performed by a London surgeon. I asked whether the iridectomy had checked the disease? "Oh, yes, I have only had four attacks since, about one each year. The first two of these were mild, but they seem to be getting more frequent and more severe again, for last year (1886) I had two, one in May, and one in December,

and the latter lasted six weeks, and was as bad as any that I have had."

He added his impression that the improvement, which dated from the operation, may have depended as much upon the effect of a better and more equable climate as upon the operation. (He has lived in South Devon since his return from foreign service.)

At the present time (February, 1887) the eye is quiet, the lower part of the pupillary edge is adherent, but the eye otherwise healthy. He asks my opinion as to the advisability of a second iridectomy.

Although Dr. M— does not consider himself gouty, he is liable to what he calls bilious attacks with lithates in the urine, and to attacks of flatulent diarrhœa. He drinks sherry, claret, and some spirits, is subject to a little eczema on the hands, and his father and brother were both "very rheumatic." I advised him to leave off wine, to take alkalies regularly, to use much more vigorous counter-irritation when threatened with iritis than he had done, and to put off a second iridectomy for a time.

There were some other interesting points in the case. His R. eye has never suffered in the least, though he can give no reason why the malady should have always taken the L. There is no history of injury.

He cannot use atropine; it always quickly brings on irritation of conjunctiva and inflammation of the eyelids, "quite erysipelatous, worse than the iritis;" even belladonna fomentation brings on the same symptoms. Homatropine irritates much less. A few days before an attack of iritis he frequently feels out of sorts, "bilious;" and if he now takes a purge, keeps quiet, and lives abstemiously for a few days he can sometimes ward off the attack.

When he is in for iritis he is aware of it by the pain in the eye which comes on when he tries to look at the end of his nose, and he is always aware that the attack has taken a favourable turn when this symptom disappears. He does not think that the attacks have much to do with the use of his eyes, but believes that they depend more upon his

health and damp inclement weather. Bright light, however, is a factor, and on one occasion when he thought he had cut short an incipient attack by purgation, &c., he brought it back by sitting next day in front of a bright fire.

I have already said that keratitis punctata, chronic thickening of the iris with very extensive synechiæ, and the existence of myopia, are in my opinion indications that iridectomy is not likely to be well borne even if a good piece of iris can be removed; I also have the impression that a tendency to spontaneous bleeding and to hypopyon make the operation undesirable. We find left to us as likely to be suitable for operation (1) cases of acute recurrent iritis without much change in the aqueous humour and without much structural change in the iris except at its points of adhesion; and (2) cases of chronic iritis with circular (not total) synechia and bulging of the iris.*

In respect even to these cases, however, particularly the acute ones, we have seen that uncertainties and sources of error abound. Whilst therefore I am clear that it is our duty sometimes to advise iridectomy against recurrent and obstinate iritis I feel sure that disappointment, both to the patient and the surgeon, will often be avoided if the operation be held in reserve until all other plans of treatment have been patiently tried and have failed.

(*November* 10*th*, 1887.)

Mr. Priestley Smith was inclined to agree with Mr. Nettleship in doubting whether iridectomy is so generally beneficial in cases of relapsing iritis as the dictum of von Graefe would lead us to believe. When the whole pupil

* I might add that I have seen a few cases in which iridectomy, performed for a first attack of irido-cyclitis (perhaps pure cyclitis) in young persons (probably of gouty family), has been followed by permanent immunity. Cases of this sort, however, are too rare, and their nature too imperfectly understood, to justify conclusions from any but a much wider experience than my own (Miss M—, P. 4, 133, and Miss L—, P. 6, 186).

margin is adherent, and fluid is imprisoned behind the iris, then, of course, iridectomy is invaluable as a means of preventing the loss of the eye by secondary glaucoma. When the adhesions are so extensive that occlusion of the pupil is likely to occur if the inflammation relapses, then certainly an iridectomy is desirable in order to prevent that evil result. But when the adhesions are less extensive it is less certain that iridectomy can influence the progress of the disease. The essential cause of the relapses is usually diathetic, and, in conjunction with other means of improving the constitutional condition, stimulation of the skin by means of salt-baths, such as those at Droitwich, is in some cases very useful.

Mr. Juler expressed regret that, owing to want of time, Mr. Nettleship had not been able to read the notes of the cases on which he based his theory as to the advisability of iridectomy in recurrent iritis. He was interested to learn that while the author of the paper appeared in certain cases to be in favour of the operation, Mr. Priestley Smith had no confidence in the results obtained by this practice. Speaking from memory of many cases of recurrent iritis which had occurred in his own practice, Mr. Juler had the greatest satisfaction with the effect produced by iridectomy. He would like to ascertain from Mr. Nettleship whether he had any particular grounds for not operating in cases where keratitis punctata was present. In certain cases of recurrent serous iritis where these dots could often be found and the tension was sometimes increased, it appeared to the speaker that the operation could not fail to be beneficial by relieving tension and by local depletion.

2. *Quiet iritis.*

By J. Hutchinson, jun.

I do not know any more convenient or expressive term to apply than the above to those cases of inflammation of the iris which are practically unaccompanied by pain, photophobia, ciliary or conjunctival congestion and irritation, and which are, as a rule, only recognised subsequently owing to the defect of vision induced by adhesions or occlusion of the pupil, or detected by the surgeon perhaps long after the attack. It may be well at once to relate a few of the cases which have come under my notice before referring to the general questions as to etiology, &c., connected with the subject.

Case 1.—A middle-aged man came under my care at the London Hospital this autumn with some curious ulcers of the arms, which were apparently syphilitic. There was a history of a chancre some years before, but no clear one of secondaries. In seeking for other evidence I inquired as to his eyes, and he stated that they "had never been bad," and that his sight was quite good. In ordinary daylight nothing wrong was noticed with them as the pupils were small, but on oblique illumination a ring of uveal deposit was found on each lens, and in one eye there were several posterior synechiæ. In this eye the lens was somewhat dull and the fundus obscured, vision being about $\frac{20}{70}$ or less, although the patient was quite unconscious of any defect. No choroiditis could be detected, and the texture of the iris was apparently normal. On pressing him he admitted that there was, perhaps, some slight pain in the forehead and eyes a few years back, but he would not own to any redness, nor, of course, had he ever thought of obtaining treatment for the condition of his eyes.

Case 2.—Daniel F—, æt. 39, came under my care at the Great Northern Hospital in March, 1887, thinking that he wanted glasses. He was vague as to the history of his defect of vision, but thought the L. eye had failed about six weeks, the R. one about a fortnight (these dates are probably quite erroneous). There was not the least trace of congestion about the eyes, the chief feature being the difference in colour of the irides, the L. iris being blue, the R. brown.

R. eye: T. n.; pupil 2 mm., dilated very slowly to atropine, no adhesions detected. Fundus normal. V. $= \frac{20}{40}$, $\bar{c} - 1$ D. $= \frac{20}{20}$.

L. eye: T. n., extensive posterior synechiæ, but pupil still dilates at parts to atropine, almost complete cataract (? secondary). V. = shadows.

There was not the slightest history of venereal disease nor of family tendency to gout; he had never had rheumatism, and was a healthy-looking man, not particularly florid. His occupation, however, as a potman enabled him to obtain large amounts of beer, and he had, until quite lately, indulged considerably in both alcohol and tobacco.

I advised him to give up taking alcohol entirely, and ordered him small doses of iodide of potassium. I saw him only a few times subsequently, his eyes continuing in the same condition.

In this case the date of the iritis was quite problematical, but he was certain that the sight had been good in each eye a few years back.

Case 3.—Charlotte J—, æt. 17, attended the Great Northern Hospital for a wound of the sclerotic of one eye due to a piece of glass penetrating the lower eyelid. The wound was at least one third of an inch long, was placed transversely, and was a considerable distance behind the ciliary region. Owing to some escape of vitreous the tension was decreased. There was very little conjunctival congestion, and what there was rapidly subsided under

boracic lotion. There was hardly any pain about the eye after the first day or two and no sign of iritis. On the twelfth day after the injury atropine was employed as a precaution, and it revealed a ring of uveal pigment, though the iris dilated well and regularly. V. has steadily improved from fingers to about $\frac{20}{40}$; the fundus, except at the wounded spot, is normal, but the hæmorrhages into the vitreous have left many opacities.

This case is so slight an example of iritis that one might hesitate to include it, but it was of interest from the fact that I saw her regularly, and each time inquired as to supra-orbital pain, &c., with a negative result. There was no ciliary congestion apart from the conjunctival redness round the wound, and practically no photophobia.

Case 4.—James F—, æt. 25, a fireman, and therefore much exposed to draughts and sudden changes of temperature, came to Moorfields under Mr. W. Tay for acute iritis of the L. eye attended with much pain, photophobia, and ciliary congestion. There were large posterior synechiæ, which did not yield to atropine entirely. This eye had been affected four days before his first visit. On examining the other eye it was found that there were numerous posterior synechiæ in that also, evidently of some considerable duration, the iris being quite clear. He positively denied having had any pain or congestion about this eye. There was little doubt as to cause in this case, there being no history of syphilis and a clear one of rheumatism. He had suffered from rheumatic fever and repeated rheumatic symptoms since, and had been in Bath Mineral Waters Hospital. Gonorrhœa (slight) four years ago. I am sorry that I have no notes as to family tendency to rheumatism or gout.

Case 5.—Jane S—, æt. 41, came for an attack of iritis in both eyes to Moorfields. R. eye: T. + ?, not the least congestion, iris perfectly clear, pupil 3 mm., did not act

to light, responded slowly to atropine, dilating to 5 mm. There were many white and brown opacities on the surface of the anterior capsule, causing some dimness of the view of the fundus, which was otherwise normal. There was, and had been, no pain. The L. eye was in the same condition, but there were rather fewer uveal deposits than in the R. There was not the least evidence of syphilis, nor was there any family or personal tendency to rheumatism, gout, or lumbago. She was a fairly healthy-looking woman, but anæmic. During nine years of her married life she had borne seven children, all living and healthy, in addition to three miscarriages and one still-birth at five months. She was now again pregnant. I do not know whether it would be right to connect the iritis with debility from the repeated pregnancies, but we could assign no other cause.

The previous cases will, perhaps, sufficiently illustrate the features of the disease, and I think such cases differ so markedly from the usual type of iritis as to deserve the epithet "quiet" or "insidious." The division into acute and chronic iritis hardly separates off these cases into one or other group, since many of the chronic cases of iritis are accompanied by very considerable pain, photophobia, and congestion. Again, cases of quiet iritis may quickly come to an end and in no way deserve the term "chronic." And the serious results of iritis are by no means measured by the intensity of the symptoms at the time of the attack. Thus, Arlt states that "a gumma in the iris may be developed without the patient being warned by pain, photophobia, disturbance of vision, or redness of the eye. A well-pronounced gumma, &c., unaccompanied by any other symptoms of iritis, may be found when the patient has attended to his business on the previous day." In an amusing article on "Teaching Ophthalmology in England" ('Ophthalmic Review,' old series, vol. iii, p. 123), a practitioner, "who had covered himself with glory and won innumerable prizes," is ridiculed for his

ignorance of this fact: "We could not make him understand that a universally adherent pupil was an evidence of past iritis, and he maintained that iritis had not existed because the patient had never suffered excessive pain, a symptom which was, he assured us, pathognomonic of the disorder." It is needless to quote from Nettleship and other authorities to show that it has long been recognised that iritis may be, in certain cases, unattended by all its classical symptoms. Severe conjunctivitis may, on the other hand, be accompanied by practically the same frontal pain, photophobia, and ciliary congestion as would occur if the iris were involved.

The object of this paper is not merely to call attention to an absence of symptoms in some cases of iritis, a fact which is well known to all ophthalmic surgeons, but to elicit opinions as to whether such a quiet or insidious course throws any light on the etiology of the affection. M. Fournier appears to make the strongest assertion on this point of any writer I have consulted. He says, "Hereditary syphilitic iritis begins almost always in a remarkably insidious fashion; it is characterised by little or no pain, photophobia, or congestion," and he suggests congenital syphilis in every case in which the "teneur froide" is present. M. Trousseau holds the same view (see 'Syphilis Héréditaire Tardive,' pp. 223—225). There are certain fallacies to be considered in connection with these statements. If the iritis from congenital syphilis occurs in early infancy, the symptom of pain cannot be estimated, and the congestion and photophobia are apt to be overlooked. If it occurs, as it frequently does, during an attack of interstitial keratitis, it is rarely practicable to separate the symptoms due to each. And certainly, judging from my father's very extensive records, and from cases under my own observation, this form of iritis is in a large proportion accompanied with as severe symptoms as any.

Apart from congenital syphilis an inherited gouty diathesis has been shown to cause iritis, which is especially

characterised by its quiet but destructive course, and of late years attention has been drawn to a similar absence of symptoms in a certain proportion of cases of sympathetic inflammation. I have tabulated thirty-seven cases in all, largely drawn from my father's records and from the admirable report on sympathetic inflammation in the sixth volume of the Society's 'Transactions.' Such a number is too small to warrant a full analysis, but the results are briefly as follows:

1. Sex and age appear to have little or no influence on the severity of the symptoms accompanying iritis. (Twenty male cases, seventeen female; earliest age nine weeks, latest seventy-two years.)

2. If both eyes are attacked with iritis and one presents the quiet or insidious form, the other will probably do the same. (But there are many exceptions; one eye may be affected with iritis which is quiet throughout, and the second may be violently inflamed.)

3. The absence of pain, photophobia, congestion, &c., by no means implies a mild course, many of the cases quoted going on to complete occlusion of the pupil, &c.

4. Of the thirty-seven cases eleven were due to sympathetic inflammation, eight probably to inherited gout, four to congenital syphilis, four to inherited tendency to chronic rheumatism. The remaining ten it is hardly worth grouping as in most of them the cause remained doubtful.

5. It may be roughly stated that whilst quiet iritis is most commonly due to congenital syphilis, sympathetic inflammation or inherited arthritic (rheumatic or gouty) tendency, it is very exceptional in connection with acquired syphilis or the ordinary rheumatic form of iritis.

No.	Sex.	Age.	Symmetry?	Result.	Cause.	Authority.
1	M.	35?	Both	V. slightly impaired	Syphilis	Author.
2	M.	39	Left	Secondary cataract	Gout; alcoholic excess?	„
3	F.	17	Right	Uveal deposits only	Wound of sclerotic	„
4	M.	23?	Left (the other acute iritis)	Many synechiæ	Rheumatism	„
5	F.	41	Both	Uveal deposits; irides clear	Uterine exhaustion?	„
6	M.	23	Right	Kerato-iritis; many adhesions; gradually improved	Inherited gout?	Mr. Hutchinson, sen.
7	F.	36	Both	Posterior synechiæ	? Syphilis; patient a delicate married woman	„
8	M.	25	„	Extensive posterior synechiæ and defect of sight	Patient undoubtedly congenitally syphilitic; no other cause found	„
9	M.	9 weeks	Left	Extensive posterior synechiæ	Congenital syphilis	Ib., Oph. Rep., vol. i, p. 203.
10	M.	4 mos.	Both	Occlusion of one pupil; posterior synechiæ in other	„	Ib., ib., p. 196.
11	F.	8 mos.	„	Very slight adhesions left after mercurial treatment	„	Ib., ib., p. 197.
12	F.	20?	„	Destructive iridocyclitis of one with retinitis; slight iritis of the other	No cause found	Nettleship, Oph. Rep., vol. vii, p. 620.
13	F.	36	„	Occlusion and complete blindness	Exhaustion from pregnancies and lactation?	Hutchinson.
14	F.	57	Left	Occlusion; punctate deposits on cornea	No cause found	„
15	M.	21	Both	Redness, but never any pain; irido-choroiditis severe	No cause found except persistent toothache?	„
16	F.	40	„	Destructive; both eyes almost blind	Inherited rheumatic tendencies; no gout	Ib., Arthritic Diathesis, vol. ii, p. 358.

No.	Sex.	Age.	Symmetry?	Result.	Cause.	Authority.
17	M.	55	Both	Many adhesions left	With chronic rheumatic arthritis of thumbs, and inherited "arthritic tendencies"	Hutchinson, Oph. Hos. Rep., vol. vii, p. 470.
18	F.	49	Right	"Keratitis punctata"	„	Ib., ib., p. 487.
19	F.	49	—	With vitreous opacities	Family tendency to chronic rheumatism	Ib., ib., vol. viii, p. 213.
20	M.	18	—	With vitreous opacities; occlusion of one pupil	Inherited gout	Ib., Lancet, Jan., 1873.
21	M.	15	Both	With vitreous opacities; membrane found in pupils	„	„
22	M.	31	One eye	Vitreous opacities; occlusion of pupil	„	Ib., Arthritic Diathesis, vol. ii, p. 455.
23	M.	(30 ?)	Both	Vitreous opacities; iris much thickened	? Inherited gout	Ib., ib., p. 457.
24	M.	24	Right	Exclusion of pupils	Inherited gout	„
25	F.	(25 ?)	Both	Exclusion of pupils	„	Ib., Oph. Trans., vol. v.
26	F.	30	„	One eye lost; the other nearly so	„	„
27	F.	65	Left	"Plastic iritis"	Sympathetic	Lawford, Oph. Trans., vi, p. 221.
28	M.	14	Right	Very slight changes	„	Ib., ib., p. 224.
29	M.	69	Left	Adhesions	„	Nettleship, ib., p. 231.
30	M.	23	„	Eye left almost blind	„	Tay, ib., p. 244.
31	M.	72	Right	„	„	Milles, ib., p. 247.
32	F.	40	„	Almost complete recovery	„	Ib., ib., p. 249.
33	F.	9	Left	„	„	Frost, ib., p. 250.
34	M.	16	„	Became blind	„	Dixon, ib., p. 261.
35	F.	30	Right	Perfect recovery	„	De Wecker and Landolt, ib., p. 268.
36	M.	17	„	„	„	Warlomont, ib., p. 269.
37	F.	Old	?	„	„	Meyhöfer, ib., p. 275.

(*November* 10*th*, 1887.)

Mr. Lawford asked if Mr. Hutchinson had observed any cases during an attack, or if recurrences had occurred. He thought that unless such were the case it would be very difficult to exclude congenital syphilis as a cause, and had been accustomed to consider these cases as the result of hereditary syphilitic iritis occurring during intra-uterine life, or very shortly after birth.

VII. DISEASES OF THE LENS AND CAPSULE.

1. *Growth of new lens fibres after spontaneous absorption of traumatic cataract.*

By R. Marcus Gunn.

(With Plate VII, fig. 1.)

The accompanying drawing illustrates moderately well the condition referred to. The injury occurred early in life, and the new lens fibres were doubtless formed in the usual manner from cells placed peripherally, just where the anterior epithelium is about to leave the capsule. Before this fresh formation of fibres the capsule rent had evidently closed, so that the new lens matter was no longer exposed to the action of the chloride of sodium of the aqueous. The intracapsular conditions, however, were evidently not natural, since the new fibres are semi-opaque.

Note.—A few days after the exhibition of this patient before the Society, the capsule and its contents were removed, and the latter were proved to be lens fibres on microscopical examination.

(*Card specimen. January 26th,* 1888.)

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2. *Symmetrical rings of pigment on anterior capsules of lenses resulting from fœtal iritis.*

By Walter H. Jessop.

Elizabeth B—, æt. 20, came to Moorfields Hospital in May, 1888, under Mr. Hulke. Patient is a dark

DESCRIPTION OF PLATE VII.

Fig. 1 illustrates Mr. Gunn's case of Growth of New Lens Fibres after Absorption of Cataract. From a drawing by Mr. A. W. Head.

Fig. 2 illustrates Mr. Nettleship's case of Stationary Night-Blindness, with minute White Spots at the Fundus. From a drawing by Mr. A. W. Head.

Fig. 1.

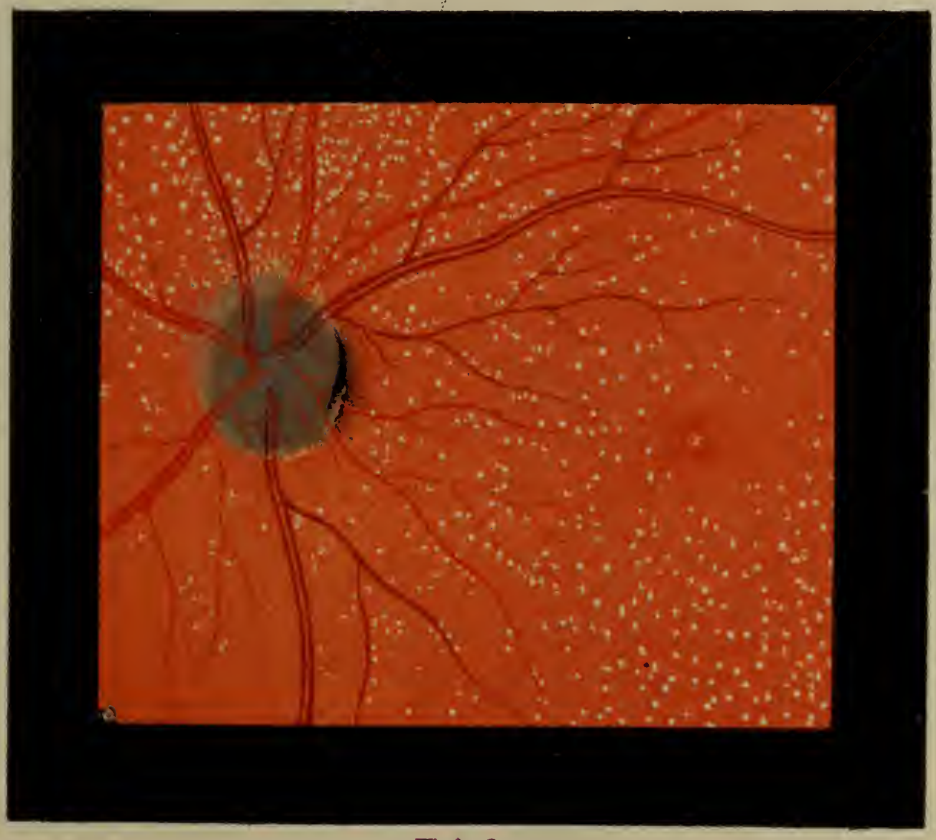


Fig. 2.

A. W. Head, del.

Danielsson & Co, lith.

brunette, has never complained of defect in vision and always seen well. She was in a gas explosion two years ago, and the left eye was slightly inflamed afterwards. No signs of hereditary syphilis. Family history good.

Left eye: Pupil slightly triangular, dilates well as to size, but not quite regularly under atropine; there is a ring of yellowish slightly streaked pigment on anterior capsule of lens, and the centre of the ring is dotted with pigment; at outer side below is a narrow streak, apparently an old iritic adhesion.

Lens: A few scattered small milk-white opacities in its substance. Fundus, &c., normal except hyperopic.

Right eye: Pupil rather quadrangular, dilates well, but not quite regularly to atropine; ring of pigment on anterior capsule as in left eye; from outer part of pupillary border of iris to pigment ring is a thin shred of pupillary membrane.

V. R. E. $\frac{6}{9}$: H. m. 1·5 D. $\frac{6}{6}$.
L. E. $\frac{6}{18}$: H. m. 2·5 D. $\frac{6}{18}$.

(*Card specimen. June 14th*, 1888.)

VIII. DISEASES OF THE RETINA.

1. *Central retinal detachment in left eye, with appearances as of albuminuric retinitis in a woman suffering from chronic nephritis and fibroid of uterus.*

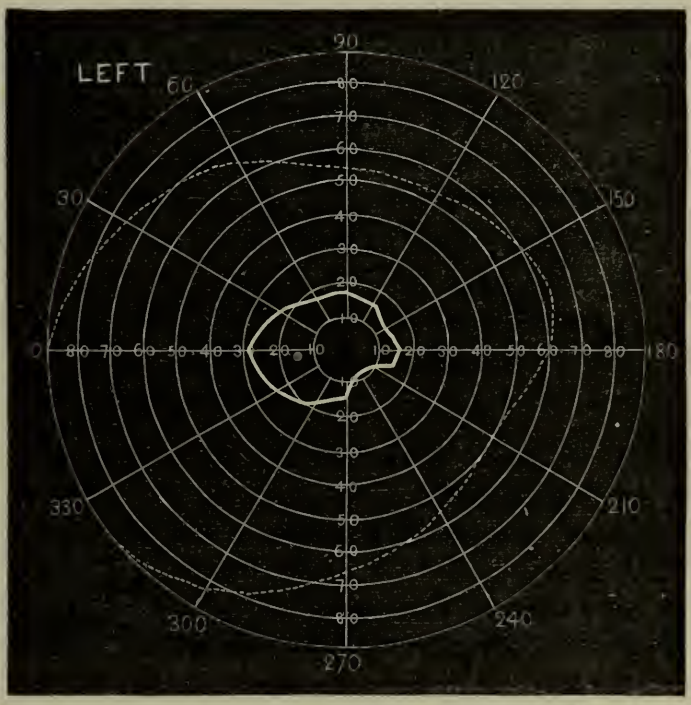
By W. J. Collins, M.D., M.S., B.Sc.

Jane P—, æt. 53, widow (seven years). Family history unimportant; one child (twenty-five years ago), one miscarriage. Is a laundress and charwoman. Always healthy until eight years ago, when she had loss of power in both lower limbs for one month. For the last seven years has had an ulcer just above left external malleolus. Six years ago she "caught a chill," and her legs swelled "like the dropsy." The ulcer and anasarca have troubled her ever since. For two years preceding the last twelve-month she had suffered from menorrhagia (in clots) and a swelling in the hypogastrium. She has severe backache, frontal headache, and occasional insuperable drowsiness.

Urine.—Sp. gr. 1020, acid; $\frac{1}{18}$th of column of albumin after boiling and HNO_3. The hypogastrium is occupied by a tumour, ovoid, mesial, the size of a six months' pregnancy; it is hard, dull, dumb; doubtless a uterine fibroid. There is a systolic, basic, cardiac murmur.

Six months ago the sight of the left eye began to fail, she thinks suddenly; no traumatism remembered. On examination with the perimeter it is found that it is central vision that is lost absolutely, peripheral perception being present but deficient. The media are clear; T. n. Occupying the site of the fovea and an area of

twice its dimension around it, is a retinal detachment presenting the usual blue grey rucked appearance, with dark red tortuous vessels riding over the rugæ. This area shades off peripherally in parts to normal retina, but above on the temporal side to a patch presenting the dead-white streaks and dots indicative of albuminuric retinitis. O. D. rosy, but no neuritis. The R. eye V. $\frac{6}{9}$, and 1 J. $\bar{c}$ + 3 D.; media clear; fundus perfectly normal.



The field of V. was taken with a small candle-flame.

This case is peculiar and interesting; peculiar in the fact of its strict unilaterality, and in exhibiting possibly a transitional form between that degenerative retinal change with which we are familiar in chronic Bright's disease, and that larger lesion of retinal dislocation from subretinal dropsy which we associate with the graver and more acute forms of renal disease; it is interesting as raising the question of the prognosis of renal disease based upon retinal changes in their different forms.

P.S. (August 22nd, 1888). — Patient seen to-day. Scarcely any change in left fundus, no disease in right. Health much the same; still anasarca of extremities and albuminuria. (*October 20th*, 1887.)

Mr. J. Hutchinson, jun., remarked that in Mr. Miley's statistics (alluded to by Dr. Anderson), which showed such an unfavourable prognosis in cases of albuminuric retinitis, he believed that those occurring during pregnancy were not included. A more complete work by Dr. Bull, of New York, fully bore out the grave prognosis in such cases. (Dr. Bull's results are given in the 'Transactions of the American Ophthalmological Society' for 1886. Out of the total of 104 patients eighty-five died within two years from the date of the finding of ophthalmoscopic changes. Of the remaining nineteen only four had been observed for more than a year.)

Dr. Stephen Mackenzie remarked that he could only recall to memory one case in which he had seen detachment of the retina in connection with albuminuric retinitis, and this occurred some years ago. In this case there was dropsy. He could not, however, accept dropsy as an explanation of the phenomenon, as whilst dropsy was common in Bright's disease detachment of the retina was so rare. (He had since been able to recall a case in which extensive detachment of the retina of both eyes occurred without any dropsy being present, in a case where the necropsy revealed extreme contraction of the kidneys.) With regard to the duration of life when albuminuric retinitis was discovered, he thought that whilst it generally was brief, yet it might be much greater than appeared the experience of some who had spoken. He mentioned a case sent him by Mr. Adams where the patient lived for two or three years, and then died of apoplexy. He was sure also he had seen other cases run a course of two or three years. He would like to elicit the experience of members whether the condition might not be recovered from. When he first began to use the

ophthalmoscope a case occurred with well-marked retinitis in connection with a grave disease of the kidney, from which recovery took place, and the patient left the hospital. When sent for some months subsequently, when a case of albuminuric retinitis was required for demonstration, the changes were scarcely discernible.

Dr. Coupland asked whether the patient mentioned by Dr. Anderson was dropsical.

Dr. Anderson said the child was extremely ill and dropsical.

Dr. Coupland then suggested that the occurrence of detachment of the retina in Bright's disease was not so much dependent upon the retinitis as upon the presence of dropsy. He had been accustomed to regard it as a dropsical phenomenon. Compared with albuminuric retinitis, detachment of the retina was quite a rare event in renal disease. He only recalled one case, and that patient was seriously ill, dying shortly afterwards.

In reference to a remark by Dr. S. Mackenzie that the rarity of retinal detachment told rather against the explanation of its being a dropsical condition, Dr. Coupland said that all he meant was that in albuminuria retinal detachment did not occur except in those who were the subjects of dropsy.

Mr. Gunn.—The serious import of cases of renal retinitis was first brought home to me by the difficulty of obtaining cases for demonstration at the courses of evening ophthalmoscopic demonstrations I have conducted at Moorfields for some years past. A register of patients' names and addresses is kept, and they are written to when their attendance is desired. The postcards addressed to albuminuric cases are very frequently returned, and on inquiry the friends have on several occasions replied that the patients were dead. I drew attention to this fact some time ago in the discussion on a case brought before this Society by Mr. Nettleship.*

* See 'Trans. Ophth. Soc.,' vol. vi, p. 334. I am indebted to Mr. Walker, junior house surgeon at Moorfields, for an inquiry regarding the cases on

Dr. Collins, in reply, said the interesting discussion which his case had raised at any rate established the fact that fundus changes in association with albuminuria were not one thing but many. As regards prognosis he considered that cases with mere retinal hæmorrhages usually associated with chronic granular nephritis were the least grave; next and of more fatal significance were the spots and streaks indicative of fatty degeneration, and most lethal of all, and usually though not invariably associated with considerable ascites and anasarca, were the cases of retinal dropsy and consequent detachment. Cases due to ephemeral causes such as pregnancy, when such causes were expressive of a transient blood-change, were naturally far more hopeful than those in which retinal degeneration meant a progressive destitution of blood and a run-down constitution.

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2. *Neuro-retinitis in Bright's disease.*

By Miles Miley, M.B.

(Communicated by James Anderson, M.D.)

My attention was first drawn to the importance of this subject by a mistake I made while acting as clinical clerk in the London Hospital for Sir Andrew Clark in the summer of 1886, and as the case illustrates some points in connection with my subject I will briefly refer to the notes.

J. W—, æt. 35, bricklayer, admitted July 10th, 1886, in a semi-comatose condition; has been a heavy drinker of

our register. He finds that of ten cases five are known to be dead, four were written about but no reply was made, while in one the retinitis had almost disappeared, leaving a few small whitish specks only nine months after first examination.

beer and spirits. Patient can with difficulty be roused to answer questions; pupils pin-hole; breathing stertorous. Pulse high tension, 62, heart's impulse inside nipple-line, not displaced. No paralysis; lies flat on his back; twitching of arms, specially the right, and of legs, with occasional slow movements of the right leg and right great toe.

Fundi.—Both optic discs much blurred, and covered with irregular fluffy-edged masses of exudation of a creamy white colour, requiring about + 2 D. to focus their surfaces. The vessels at their exit are completely hidden under these exudation masses. White patches scattered over the fundi, and numerous hæmorrhages, are present.

Urine.—Straw, 1010, acid, no sugar or albumen, granular casts present. Water passed into the bed in large quantity.

Mr. Couper was requested to examine the eyes, and reported, "They resemble the appearances seen in albuminuric retinitis."

Not having at that time read Dr. Hughlings Jackson's paper and the discussion on this subject in the first volume of this Society's 'Transactions,' I was surprised to hear Mr. Couper say that in no case would he definitely diagnose renal disease from fundi changes alone. Considering the pulse, arteries, urine, twitchings, and what I had so far imagined to be fairly typical eye-changes, I had made up my mind the case was one of granular kidney, and was astonished to see on post-mortem examination multiple gliomata of the brain, with secondary deposits in the lungs. The kidneys, which were not markedly granular to the naked eye, showed both arterio-sclerotic and interstitial changes under the microscope.

This case, though the eye-changes may have been due to both or either of the brain and renal conditions, helped to teach me a fact I believe to be generally recognised, viz. that the neuro-retinitis of cerebral tumour and of Bright's disease may present exactly similar ophthalmoscopic appearances. From what I saw, and from what I heard taught, especially by Dr. James Anderson, I was

struck by the high rate of mortality in these cases, and set about finding out if the prognosis in cases of Bright's disease is really affected by what appeared to be a sign of extremely bad import.

The figures which I shall give were obtained in the following manner:

The names of all the cases occurring in the London Hospital Medical Registers under the headings of acute and chronic renal disease for the years 1884-5-6 were taken, and the notes examined and extracted, in all 447 entries.

This number is reduced by twenty-six for readmissions of patients, and by forty-six for acute scarlatinal cases, so that the total number of cases under consideration is 375.

In 211 of these no separate statement has been made regarding the condition of the eyes, but in justice to my hospital and in reference to my figures, I must add that in many instances the bed-ticket has the order "Homatropine to the eyes," a statement, I think, which gives fair reason for assuming that the number of eyes examined, and the number of eyes examined and found normal, are both smaller than they should be.

Of the remaining 164 cases 105 were stated to be normal, three were affected with other changes, five from the nature of the notes I rejected as questionable, and fifty-one were definitely stated to have been affected.

The mortality is as follows:

1. Total number of cases considered . . = 375
   Total number of deaths in hospital in 1884-5-6 . . . . . = 144
2. Number of cases definitely stated to have been unaffected with neuro-retinitis . = 105
   Number of deaths during the same period amongst these cases, in hospital . = 28
3. Number of cases stated to have been affected with neuro-retinitis . . = 51
   Number of deaths during the same period in hospital . . . . . = 27

That is to say, the mortality of the affected cases was in the hospital double that of the unaffected, and that without taking into consideration the homatropine cases above referred to.

With the affected cases that left the hospital I communicated by post. As a matter of fact I began by calling personally at the addresses given at the hospital, but soon discontinued this method, for I found that the kind of East-end tenant I was after seldom remains long in any one residence, and either from pecuniary or other reasons never leaves any trace of himself behind.

Finally, I consulted the death registers at Somerset House. Here, of course, the question of identity comes in, and if anyone present has had the pleasure of looking up the death of a Smith or a Jones over a period of three years at Somerset House he will agree with me that the task of settling that question is not a light one. In cases where there was any doubt I have communicated with the certifying doctor before considering the question settled.

By these various means forty-five deaths out of the fifty-one affected cases have been traced.

The six cases unaccounted for were all admitted into the London Hospital, judging from the notes, for the first time in 1886; and since the Somerset House Indexes are at present available only up to the end of the first quarter of the past year, they cannot be traced with any certainty after March, 1887.

Sex.—Thirty-eight males, thirteen females.

Age.	Under 20	20—30	30—40	40—50	50—60	60—70
	2	13	10	16	6	4

Post-mortem examination.—Twenty-two affected cases examined.

Granular kidney 17 (15 with hypertrophy of heart).
Large white kidney 3 (1 ,, ,,).
Large white kidney passing into granular 2 (2 ,, ,,).

Twenty-two unaffected cases examined.

Granular kidney	7	(5 with hypertrophy of heart).
Large white kidney	13	(1 „ „).
Atrophic	1	(heart *nil.*).
Pyelonephritic	1	(heart *nil.*).

Duration of life.—As most of the cases were already affected with neuro-retinitis when admitted into the hospital, it is only possible for me to give the length of life after the first note was taken. The average duration of life of the forty-five cases that have been traced is under four months from the time the first note of eye-changes was made.

	Months.												
Under	1	2	3	4	5	6	7	8	9	11	14	18	= 45
Deaths	13	7	6	1	6	4	1	2	1	1	2	1	

One case lived nearly eighteen months, and two fourteen months, all the rest died within the twelvemonth.

If all the six untraced cases are still alive, not one at the present date will have lived as long as eighteen months from the date the eye-changes were first noted.

The following nine cases are of special interest, because I am able to quote dates of eye-changes occurring under observation.

	Age.	Sex.	Fundi normal.	Changes noted.	Death.
R. B.	47	M.	Feb. 19, 1884	March 6, 1884	April 11, 1884
E. C.	25	M.	March 24, 1885	March 31, 1885	Oct. 5, 1885
T. D.	62	M.	May 28, 1885	June 12, 1885	Nov. 6, 1885
G. O.	51	M.	June 11, 1885, "slight haze"	June 25, 1885	Aug. 2, 1886
G. A.	31	M.	July 20, 1885	July 25, 1885	Dec. 17, 1885
G. C.	40	M.	April 2, 1886	July 19, 1886	Aug. 24, 1886
J. W. G.	51	M.	Aug. 5, 1886	Oct. 14, 1886	Alive in Dec., 1887
E. C.	63	F.	June 19, 1886	March 26, 1887	Aug. 4, 1887
H. D.	23	F.	Sept., 1886	Nov., 1886	Nov. 28, 1886

Counting, in order to be on the safe side, from the last date when the fundi are stated to have been normal, the

duration of life among the nine cases has not averaged more than six months.

With regard to the eye-changes themselves, I do not think the notes generally are sufficiently full to enable me to draw any accurate conclusion. In some cases a slight haze is the first recorded change, in others papillary exudation, and in others one or more hæmorrhages.

In two cases it took about a month for white patches to develop after the first appearance of hæmorrhages. In five cases the notes show that the changes were clearing up; of these, three are dead, one was alive in April last, and one in December last. One of these, a Swedish sailor, under the care of Dr. Stephen Mackenzie, is stated to have had, on July 2nd, 1885, hæmorrhage and white patches in both fundi, and on October 17th, 24th, and 30th, the notes state that no changes were then present. This appears to be an instance of the disappearance of patches of degeneration, and therefore contrary to the usual experience. The man died in December of that year.

The only paper I have been able to find bearing on this question of prognosis is one by Dr. C. S. Bull in the June half-year number of 1886 of the 'American Ophthalmological Society's Transactions.'

I first saw a report of this paper in the 'Ophthalmic Review,' and am sorry I did not see it before I had nearly finished my search in the hospital registers, as the prognosis of renal disease with neuro-retinitis following pregnancy appears from it to be much more favourable than in the ordinary cases. I have since gone through all the female cases in my entries, but find no case complicated with pregnancy.

In the discussion following this paper I see Dr. Webster quotes the case of a clergyman who ten to fifteen years previously had had the condition of the fundi recognised, and who was still living at the time Dr. Bull's paper was read.

This case shows the great importance of comparing

private with hospital experience. Judging from my statistics alone I should feel justified in submitting that they show, as regards the experience in the London Hospital,

1. That the retinal changes occur late in renal disease.

2. That their presence appears to affect the prognosis very materially for the worse, the mortality amongst the affected cases being at least doubled.

3. That the prognosis is so bad that eighteen months is an exceptionally long term of life after the changes have been recognised.

4. That therefore the ophthalmoscope affords a most valuable index as to the course any given case of Bright's disease is taking (except perhaps in pregnancy cases), unless, indeed, we suppose that the mortality of the cases I have this evening considered happened to be exceptionally high independently of the causes at work which produced the coincident neuro-retinitis.

In conclusion, I should like to take this opportunity of offering my best thanks to the physicians of the London Hospital for allowing me to make use of their cases, and to Dr. James Anderson in particular, without whose teaching I should very likely not have been specially interested in this subject, and without whose kind suggestion and assistance I should not have had the honour of bringing it before this Society this evening.

(*January 26th*, 1888.)

Mr. M. M. McHardy said,—I feel that it is important in considering this matter that we should clearly distinguish between hospital patients and those in very much easier circumstances. Among the former I have been unable to trace an example of life continuing longer than two years after definite neuro-retinitis has been recognised in connection with albuminuria; and in a very large majority of the patients death has resulted within a twelvemonth of the ophthalmoscopic diagnosis. With the above generalisation I must quote one exception, or rather, more correctly speaking, one apparent exception. The ex-

ceptional case is that of a woman with albuminuria, in whom *one* eye presents very typical retinal changes while the other is absolutely free, and this case has continued under observation now upwards of four years without the second eye becoming involved. These very exceptional examples of monocular neuro-retinitis with albuminuria need scarcely be allowed to affect our statistics and inferences regarding the prognosis in ordinary cases.

Reference to the cases I have seen in private patients, who are necessarily in much easier circumstances than hospital patients, and who are much more attentive to the exercise of such precautions and self-discipline as contribute largely to the welfare of the victims of albuminuria, shows those to have a considerably longer lease of life than persons in analogous conditions belonging to the class of hospital patients.

I think that for patients in easy circumstances who will strictly adhere to our advice a favourable prognosis may be given either when the patient is a juvenile, and the mischief follows quickly upon an acute nephritis, or when it is a result of pregnancy. I have seen some of the former recover completely, and have traced three cases which respectively died twelve years, and are living four and seven years after my first recognition of the retinal and urinary trouble during an early pregnancy.

Excepting the two special classes of well-to-do patients just referred to, I cannot doubt the grave prognosis which we should ordinarily formulate when we discover these associated retinal and kidney symptoms.

However, experience of a few exceptional cases, in which excess with alcohol was the common exciting cause, and in which the patients are living as much as five years after the associated disorders were diagnosed, enables me to temper the very grave prognosis suggested by hospital cases alone, and the still graver prognosis suggested by the ordinary result in private cases, with a well-justified considerable hope of an exceptional result being secured not infrequently. As many of these cases which I

examined of late years have been patients under the care of Dr. George Johnson, I have ascertained that his subsequent experience of such certainly gives the impression that quite usually a fatal result occurs within a year or two of the diagnosis.

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3. *Five cases of albuminuric retinitis.*

By Gustavus Hartridge.

Henry J—, æt. 41, came to me in March, 1886, complaining of loss of sight. Well-marked "albuminuric retinitis" in both eyes; urine contained albumen $\frac{1}{6}$; patient said he felt perfectly well at the time. He died in December of the same year.

Colonel G—, æt. 55, came to see me in May, 1886, on account of failing sight. Extensive albuminuric retinitis in both eyes. Urine acid, sp. gr. 1016, albumen $\frac{1}{3}$. Made no complaint of general health, and never remembered being under medical treatment. Died in August, 1886, of uræmic convulsions.

Surgeon-Major B—, æt. 45, consulted me for failing sight in January, 1886. Extensive albuminuric retinitis in both eyes. Urine contained albumen. Died of uræmic convulsions in November, 1886.

Mrs. W—, æt. 50; sight had failed of late was the complaint in March, 1887, when well-marked albuminuric retinitis was detected in both eyes, urine albuminous. Died in December of the same year.

(*February 5th*, 1888.)

Mrs. T—, æt. 65, widow, came to me on March 14th, 1888. She said her sight had been failing for past nine months in both eyes. Since then they had gradually got worse. Has always enjoyed good health with the exception of an attack of inflammation of the lungs sixteen

years ago. For three or four months has passed a greater quantity of water than usual, and had to get up once at least every night to pass water. No swelling of feet.

R. V. $\frac{3}{60}$, H. m. 2·50 = $\frac{6}{24}$.

L. V. $\frac{2}{60}$, H. m. 1·25 = $\frac{6}{60}$.

Urine acid, sp. gr. 1008, albumen $\frac{1}{16}$.

Ophthalmoscope.—Albuminuric retinitis of both eyes. At the beginning of April she began to feel very unwell. I saw her four times in April and June, when she ceased attending, and on inquiry I found she died on August 7th.

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4. *Subretinal effusion in chronic nephritis.*

By James Anderson, M.D.

Retinal detachment is rare in children from any cause, and retinal detachment from renal disease is rare even in adults. The case I am about to record, therefore, occurring in a child of nine years, is of some interest. So far as the ocular and renal condition is concerned, it is almost an exact parallel to the case recorded by Dr. A. D. Davidson in vol. i of our 'Transactions,' p. 57.

Elizabeth E—, æt. 9 years, was admitted into the London Hospital under the care of Dr. Samuel Fenwick on March 14th of last year. Dr. Fenwick has kindly permitted me to use the notes of the case made by his house physician, Mr. Redmayne, and by myself. She was a very pale, wasted little creature, with harsh dry skin, complaining of sickness and headache. The urine was not examined for a few days, but it was then noticed that she passed a large quantity, 50 to 65 oz., of specific gravity 1010 to 1012, and containing about a quarter of albumen, some free blood-discs, and small hyaline,

granular, epithelial, and blood casts. The heart was found to be hypertrophied, and the arterial tension high. The ophthalmoscope showed double neuro-retinitis.

I ascertained subsequently from the parents that the child had been healthy till the age of eighteen months. At this age she had an attack of measles, followed by bronchitis, and she was never subsequently well, had "consumption of the bowels," and wasted, was treated for rickets at Shadwell Hospital, but through it all retained some colour. In November, 1886, it was noticed that she frequently got out of bed to pass urine, but there was nothing unusual about the urine. About five weeks before admission to hospital she complained of headache and sickness, and that she could not thread a needle. A fortnight before admission she had a severe fit, was universally convulsed, and then lay unconscious for three days. When she recovered consciousness she was practically blind, but partly recovered vision. She had no swelling of the face or legs at this time, and the urine was quite clear.

I was asked to see the child on April 10th, and found severe neuro-retinitis with numerous hæmorrhages and considerable pale exudation in the papilla and retina, which were best seen with + 4 D. On the nasal side of each fundus there was extensive detachment of the retina, which was greyish pink and glistening, the vessels seen climbing over the surface with + 9 D. The surface of the detachments oscillated freely but slowly when the head was moved, becoming more or less horizontal in the different positions of the head. The child was almost quite blind, but was mentally clear. Previously there had been, it was said, some puffiness of the face and legs, but at this time there was no œdema of face or limbs, only extreme pallor and general wasting, with a strong cardiac impulse and high arterial tension.

During the next few days the retinal detachments increased markedly till they presented the following appearances (sketches exhibited). That in the left eye is exten-

sive, showing numerous bladder-like bulgings round the lower and nasal periphery. In the right eye four large detachments almost meet in the middle, leaving only a narrow quadrangular chink, at the bottom of which the fundus can be seen with + 4 D., pale and spotted with small hæmorrhages. The tension of the right globe was at this time somewhat increased, that of the left was normal.

From this time the child got rapidly worse, the face and limbs became slightly puffy, the urine diminished in quantity and became almost pure blood. Treatment had no effect. She became more drowsy, had vomiting, epistaxis, and bleeding from the bowel, and died comatose on April 24th, about three months, that is, from the first complaint of visual defect and marked uræmic symptoms.

At the necropsy the kidneys showed advanced fibroid contraction. The left weighed only ¾ oz., and was much distorted by a deep fibroid scar at its upper portion. The right weighed 2½ oz. and was less severely affected, but both showed, microscopically, advanced interstitial nephritis, with numerous linear hæmorrhages along the straight tubes. The mucous membrane of the pelves of the kidneys, the ureters, and the bladder was infiltrated throughout with blood, and that of the bladder was raised into soft polype-like growths. On opening the eyeballs the retinæ were found separated from the choroids by a clear, straw-coloured fluid, which escaped at once, the retinæ opaque and thickened, and the papillæ much swollen. The brain and other organs showed no gross lesions.

The case is, as I have said, almost an exact parallel to one recorded by Dr. Davidson. A girl, aged 14 years, who had, however, also cerebral hæmorrhage of the usual type in the left hemisphere, was admitted into St. Thomas's Hospital, and died four months later with uræmic symptoms. He does not mention the previous history of his case. In vol. i, p. 58, Dr. Quinlan records a case of retinal detachment with retinitis in chronic parenchymatous nephritis, a woman,—aged 56, who died

with uræmic and dropsical symptoms a month after the visual symptoms were noticed. These two cases and Mr. Collins's case shown at a recent meeting of the Society are all that have come before us.

Not only is retinal detachment rare in children, but chronic interstitial nephritis is also rare, and I have therefore recorded the case somewhat more at length than was perhaps ophthalmologically necessary. The starting-point of the renal disease was most probably the exanthem, seven and a half years before, at the age of eighteen months. The child never had scarlet fever so far as I could ascertain, but I doubt not scarlet fever is occasionally associated with this condition. The rarity of such cases and the absence of œdema may very readily cause them to be overlooked until declared uræmic symptoms appear, and may even then cause them to be misunderstood.

(*January 26th*, 1888.)

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5. *The prognosis as to life of renal retinitis.*

By Simeon Snell.

I must ask you kindly not to consider this communication other than as a contribution to the discussion on the prognosis of the retinal affection associated with Bright's disease, for I can lay no claim to any special observations on the subject, but when recently I heard it was to be under review this evening I looked through my case books, with the result I now bring before you. The data are very meagre, and by themselves are not of much value; but as an instalment added to the other observations made to-night, may be deserving of some record.

For long I have been convinced of the bad prognosis as to life attaching to the cases of retinitis albuminurica

that come before the ophthalmic surgeon. I do not mean merely that a fatal termination attends the disease, but that patients so affected are to be regarded as, generally speaking, having a tolerably defined and short limit to their existence.

It has been asserted that the appearances in the retina may precede the kidney disease, but in my opinion Dr. Gowers correctly states the relation when he says in his work on 'Medical Ophthalmoscopy,' speaking of the retinal changes, "They commonly correspond in time with the development of cardiac hypertrophy. Not that there is any necessary connection between the retinal and cardiac changes, other than they both indicate a pronounced and prolonged effect of the renal disease upon the system." Moreover, the occasional absence, for a time, of albumen from the urine in some forms of kidney disease must be recollected.

The prognosis of the retinal lesion is truly that of the kidney disease. I do not think, however, that our English writers insist on the point that in certainly the majority of cases the presence of the retinal changes betokens such a grave condition that the period of existence is limited. Nor do I recollect statistics showing the length of time that patients lived after the eye disease manifested itself.

Dr. C. S. Bull, before the American Ophthalmological Society for 1886, presented an analysis of 100 cases of retinitis occurring in the course of Bright's disease. He regarded the prognosis of life as very unfavourable. Out of the total of 103 cases collected during thirteen years, eighty-six had died, fifty-seven during the first year, and twelve during the second year; of the seventeen still living, fourteen were seen during the last six months, one had been seen seven years previously. Dr. Gruening stated, also, that he had found in 100 collected cases, that none had lived over two years after the diagnosis of retinitis albuminurica had been made. None of these remarks refer to the retinitis of pregnancy, with which I shall deal later on.

The diagnosis of Bright's disease by the ophthalmoscope in patients whose general health has not seriously, if at all, aroused their attention, is of daily occurrence. We diagnose thus the kidney disease, and the patients pass under the care of their medical attendant, or in general hospitals are transferred to the medical side. They are clearly physicians' cases, and the ophthalmic surgeon's acquaintance with them is brief. The physicians are thus far more able to deal with questions of prognosis than ourselves. But considering the numbers that have at one time or another passed before me, I confess it did seem surprising that I could hastily, for the purpose of this communication, only count up eight cases in my case book, of which I could then ascertain the results as to life. More leisure would undoubtedly add to the numbers, but I doubt if our case books will show many final results unless for some special purpose these have been collected. The cases I give are spread over several years.

Case 1.—Albert S—, æt. 37, a file-cutter, was first seen on November 29th, 1887. He had complained of sight failing for a month. The ophthalmoscopic appearances were characteristic; hæmorrhages and white patches, some of the latter in the macula of each eye. The urine contained $\frac{1}{6}$ albumen, sp. gr. 1010. He had aortic (insufficiency) and mitral disease (regurgitant). He was transferred to my colleague Dr. Dyson. He left the Infirmary a few days before his death on January 12th, 1888, which was due to uræmia.

Case 2.—William H—, æt. 34, came under observation at the Infirmary on August 19th, 1887, complaining of the right eye becoming blind. Characteristic white patches and hæmorrhages were found in the retina. The left eye was quite normal, both ophthalmoscopically and as to vision. He made no complaint as to his health.

Albumen was present in the urine in large quantity. He was seen for a few weeks and then disappeared. I

have ascertained that he died on January 2nd, 1888; convulsions preceded his death. The left eye continued unaffected.

The case is of interest also as an example, very rare, of the lesions being monocular. I have, I believe, seen one other case which was not traced to the final termination. Mr. Eales related a monocular case before the Society.*

Case 3.—Mr. Fredk. B—, æt. 56 (Book 3, p. 586). January 8th, 1884.—Sight failing a few weeks. V. = R. $\frac{20}{50}$, L. $\frac{20}{70}$. White dots at both maculæ; well-marked neuro-retinitis. Urine, sp. gr. 1010, albumen. Mr. Hawthorne, his medical attendant, kindly informs me that he died on June 27th, 1884.

Case 4.—Major M—, æt. 59. Had been in the army thirty-nine years. May 7th, 1883.—Sight failing two months. R. V. = $\frac{20}{100}$, L. V. = $\frac{20}{200}$. Numerous small hæmorrhages in both eyes and also at disc; white patches in both maculæ, not so much elsewhere. Urine, sp. gr. 1016, albumen. Heart hypertrophied. Died end of March or first week in April, 1884.

Case 5.—Mrs. T—, æt. 31. Had been in Egypt and Turkey a good deal. November 22nd, 1881.—Sight failing for one month or six weeks. R. with glass $\frac{20}{70}$; L. with glass $\frac{20}{70}$. Both eyes white patches and few hæmorrhages. Urine contained albumen. Vision for a time a little improved and urine became less albuminous. Died February 3rd, 1882; convulsions and coma.

Case 6.—Mrs. M—, æt. 66. October 28th, 1886.—Sight failing six months. L. V. $\frac{20}{200}$; R. V. fingers or more. Characteristic hæmorrhages or white patches in both eyes; neuro-retinitis. Urine, sp. gr. 1010, loaded with albumen. She died in the middle of March, 1887.

Case 7.—A young woman, æt. about 23, died in six or eight weeks after the diagnosis of renal disease from the retinal appearances was made.

* Vol. v, p. 126.

Case 8.—A physician, æt. 39, on August 31st, 1875, suddenly became affected with blindness through a hæmorrhage in macula of the left eye. He died of uræmia on January 7th, 1877. I have included this case because I afterwards heard, subsequent to his leaving the district, that the other symptoms of retinitis appeared.

The periods elapsing in the cases mentioned from the time when they deemed it necessary to seek advice respecting their sight are as follows, in order as related: six weeks, four and a half months, five and a half months, ten months, two and a half months, five and a half months, two months, fourteen months; the age of each being 37, 34, 56, 59, 31, 66, 23, 39. Five were males, three females.

The number of cases here given is not sufficient to do more than lend support to the contention that the appearance of retinitis with the characteristic patches in the course of Bright's disease indicates that the affection has become of so serious a character as, generally speaking, to point to the expectation of only a limited existence. There are cases, I doubt not, who linger a considerably longer time. I feel sure I have seen some, but I cannot trace any to their end up to the present.

The prognosis respecting life is not, I think, altogether affected by the improvement which sometimes takes place in the retinal appearances and in vision. Such was the case with Mrs. T— (No. 5).

Retinitis albuminurica occurring in connection with pregnancy, as is generally held, admits of a much more favourable prognosis than does the class of cases we have before alluded to. It has been said that the disease occurring in the earlier months of pregnancy is to be regarded more seriously than when it manifests itself only after the sixth or seventh months. This merely seems the prognosis of the kidney affection, which would be more unfavourable, speaking generally, for the longer period it was manifested. The cases I have seen towards

the latter part of pregnancy have terminated favourably.

One of the worst of these was a case recorded in the 'Lancet,' 1879, vol. i, p. 439, by my relative, Mr. W. Oxley, of Rotherham, with whom I saw the patient. Blindness in a primipara (March 17th, 1876) was sudden and complete. She was perfectly sensible; but later, coma supervened; and after the birth of a stillborn child she made a good recovery, and sight improved so much that she could in twelve months see to do fine needlework. The appearances were well defined; the retinæ were studded with white patches and hæmorrhagic spots, involving, in one eye, especially the macula. Vision at this time was reduced to the indistinct perception of large objects.

At a later period, when her sight had improved and she was able to read small print and do fine needlework, the condition of each fundus oculi had wonderfully altered; only a few small atrophic retinal patches were visible in addition to some remaining pallor of optic papillæ. Shortly afterwards, when expecting her second confinement, she was seized with apoplexy, the right arm and leg being paralysed. She died of pneumonic phthisis in January, 1882. (*January 26th*, 1888.)

Dr. James Anderson had not meant his case of retinal detachment as a contribution to the subject of Dr. Miley's and Mr. Snell's papers, although incidentally it illustrated the subject. Since his student day's his attention had been directed to the subject under discussion, and he had early begun to form the opinion that neuro-retinitis appearing in the course of renal disease was a symptom of extremely fatal import. During his term of office as Medical Registrar at the London Hospital, he had read the notes of something like 150 cases of renal disease yearly, and had seen and examined many of the cases included in Dr. Miley's paper. This experience had confirmed his opinion, and for some years he had ventured to

teach that the occurrence of neuro-retinitis in renal disease probably meant death within twelve months, and almost certainly that life would not be prolonged for two years. He admitted, of course, that there were exceptions, but they were very few, and if properly sifted they would probably be still fewer. The majority of the cases were chronic interstitial nephritis; but whether interstitial or parenchymatous, the symptom implied an advanced stage of the renal disease, or, rather, of the tissue changes associated with the renal disease; and he was not sure that it then made much difference as to prognosis whether the patient were a hospital or private patient. Dr. Miley had recognised, however, that his statistics dealt with hospital patients, and also that he did not distinguish between the various forms of renal neuro-retinitis, the prognostic meaning of which probably varies considerably. The monocular cases referred to by Mr. McHardy and Dr. Van Millingen must manifestly be placed in a separate category. A neuro-retinitis from cerebral tumour or other intracranial causes may present appearances indistinguishable from renal neuro-retinitis, and in all monocular cases the urinary and cardio-vascular symptoms of granular kidney would be essential to the diagnosis. Dr. Miley had, to his knowledge, taken a vast amount of pains in his inquiry, and had used every precaution to avoid mistaking the identity of any of his cases. His paper, he might venture to say, was a piece of most conscientious work, going far, along with Dr. Bull's statistics, to settle the point under discussion.

Dr. W. J. Collins said that the case he showed at the Society's meeting in November was still alive and under observation; the symptoms were still confined to one eye and the retinal detachment was *in statu quo*. He could add another case of almost complete and bilateral retinal detachment in acute nephritis in a man aged 26, of fourteen days' duration. The detachment was preceded by two days' blindness and intense neuro-retinitis. A post-mortem examination of the retinæ did not disclose anything

further than the appearances of serous infiltration and early degeneration. He pointed out a fallacy underlying the statistics brought before the meeting; they did not exhibit the frequency and fatality of albuminuric retinitis cases accompanying Bright's disease, but their frequency and fatality in cases so grave as to necessitate admission into hospital. As to the proximate causation of the various retinal conditions which occur in albuminuria, he would suggest that three classes should be differentiated: 1. Those cases of subretinal effusion which are found only in association with grave and profound renal disease, where liability to sub-surface effusions is strong and the dislocation of superjacent surface membranes imminent. 2. The hæmorrhagic cases indicative of high blood pressure, arterio-capillary fibrosis, and hypertrophied left ventricle. 3. The degenerative cases with white dots and streaks. These depend upon the hydræmic condition of the blood, consequent upon the drain of albumen, and the imperfect nutrition which followed in its train; in this class too come the cases of albuminuric retinitis accompanying pregnancy. The blood is in the same hydræmic state in pregnancy, only the condition in this case is transient and ephemeral, and the prognosis proportionately good. It is quite different when the malnutrition which these changes indicate is part of a downward stage of tissue degeneration.

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6. *On embolism of a branch of the central retinal artery treated by massage, with restoration of the visual field.*

By P. H. Mules, M.D.

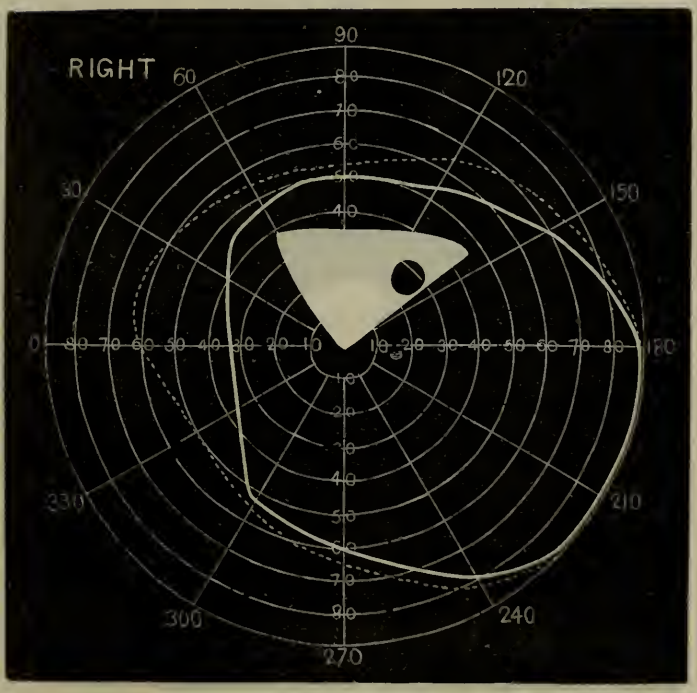
On March 7th, at 11.30 a.m., Kate A—, æt. 21, perceived a sudden blank over a portion of the upper segment of her right visual field. Within an hour she was

at the Eye Hospital. Her field, taken rapidly with fingers, was contracted above. We found, with the direct image, the lower retinal artery from its entrance on the disc until it had passed the fork of its first bifurcation, of full size, but dead white as though it was stuffed with cotton wool. At corresponding points just beyond this, both branches were well filled with blood and passed to the periphery, the contrast in colour of the sharply-cut transverse lines of the fork being striking and remarkable. Faint œdema accompanied the vessel and pervaded the adjacent retina, which was ticked with glistening specks; no central change.

Massage of the globe was at once commenced and continued for two or three minutes, when on further examination with the ophthalmoscope we found the whole artery well filled, the white plug having disappeared. The patient at once noticed her improved vision, and on testing we found its acuteness normal. At 2.20 a chart (A) was taken by Dr. Griffith with McHardy's perimeter. The field still contracted above. Next day, field limit with fingers normal; only traces of œdema now visible. On March 10th we find with the perimeter field (B) for white normal, also for red, but the patient notes a positive scotoma which, mapped out, shows on the chart a triangular gap extending upwards from the fixing point to three fifths of the boundary, but containing an island of accurate perception. On March 31st (C) there are two scotomata, both together less than that of the 10th, separated by a percipient space. On June 30th (D) the upper scotoma is gone, the lower slightly extended, vision and fundus normal. She never perceived any difference in her work as dressmaker. Heart-sounds natural.

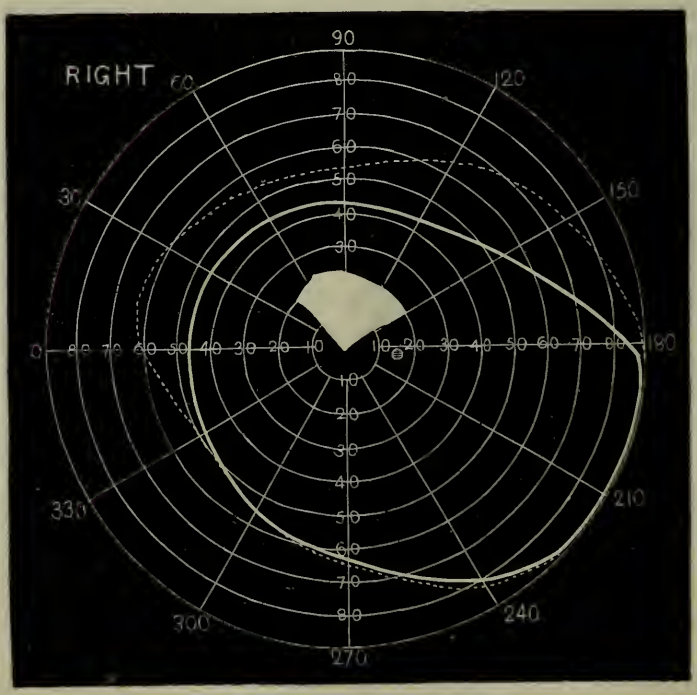
I have seen it stated that three-quarters of an hour of retinal blocking suffices to destroy its visual perception, but I do not think it has ever before been noted that the destruction is confined to the percipient elements, rods and cones, not the conducting power, the nerve-fibre layer. The charts of this case appear to be conclusive. I would

A.—Field on March 7th.



B.—Field on March 10th.

C.—Field on March 31st.



D.—Field on June 30th.

ask the members to be good enough to solve the following questions for me:—1st. Why was the clot dead white and so easily dispersed? 2nd. Where did it go? 3rd. How did the further portion of the field escape destruction unless collateral circulation was present, the scotoma being confined to the more immediate neighbourhood of the clot?

(*July 6th*, 1888.)

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7. *On hæmorrhages in the macular region.*

By William Lang.

The exact situation of the large extravasations of blood which are occasionally seen in the posterior pole of the eye is still a debateable point, and will doubtless remain so until an opportunity arises for making a microscopic examination of one of these cases. Meanwhile, I would draw attention to the following case, which is a typical one of the kind under discussion, and try to prove by its means that occasionally these extravasations take place between the hyaloid membrane of the vitreous and the retina.

J. R. J—, æt. 20, a clerk, has always enjoyed good health, his only illness being measles when a baby. Ever since he can remember his bowels have only acted once a week, and then with considerable straining. He has had no headache, vomiting, or bleeding from the nose. There is no family history of gout, rheumatism, or vascular disease.

About three weeks before coming under my care at Moorfields he noticed on resuming his reading, after an action of the bowels, that his sight was misty. After rubbing his eyes he observed a red blur, and on closing the right eye found he could barely see with the left eye. The right eye was normal, V. = $\frac{6}{5}$, the left V. = 20 J.

eccentrically, and the field of vision was normal in extent, but its centre for about 10° was occupied by an absolute scotoma, which corresponded to a large hæmorrhage which filled the macular region.

This hæmorrhage, about three times the diameter of the disc, was perfectly circular, except above, where it was flat horizontally. It had a regular and well-defined edge, separated at its inner side from the disc by a narrow margin of normal fundus. It was slightly darker in colour than the normal part of the fundus, did not appear to be appreciably raised, and was uniform in appearance except for some small yellowish-white dots at the lower and inner part of its edge. All the retinal vessels were completely lost at its edge. A daily action of the bowels was obtained by dieting and the use of cascara sagrada, and the hæmorrhage gradually absorbed until the vision was again normal.

During the absorption, which took place by a gradual sinking of the upper horizontal margin, every light appeared with this eye to be of a red colour, and at the same time a streaky appearance was to be observed at the upper part of the hæmorrhage. I was unable at the time to get a drawing of this appearance, but an idea of what it was like can be gained by looking at a drawing at p. 116 in vol. iii of our 'Transactions,' where similar but much coarser lines pass from the foreign body there represented towards the disc.

These lines appeared to radiate from a large vein, a main branch of the superior temporal, which came into view as the blood absorbed, and could be traced over the unabsorbed part of the hæmorrhage.

Four months later V.$=\frac{6}{5}$, 1 J., but still the vision was not quite so clear as with the right eye. The only observable change in the fundus was the thin wavy streaked appearance starting from the upper temporal vein, but even this was extremely faintly marked.

In the fourth volume of our 'Transactions,' at p. 148, Mr. Morton records a similar case. His accompanying plate

almost represents my case at one of its phases, except that the white border was never so wide and was always separated from the disc by a band of normal fundus. He says at first a positive scotoma occupied the centre of the field of vision and corresponded to the ophthalmoscopic appearance ; the vision returned to normal as the hæmorrhage gradually absorbed, the retina at the same time being thrown into folds. At a later date the retina was regaining its normal appearance.

In volume vi Mr. Jessop records a similar case at p. 335, and here also the vision, at first obscured by a positive scotoma, which made everything look dark red, gradually recovered.

Mr. Silcock's case, recorded at p. 176 of the seventh volume of our 'Transactions,' under the heading of "Choroidal Hæmorrhage at the Posterior Pole of the Eye," also had a positive scotoma.

Now, De Wecker states in his article on the choroid, in De Wecker and Landolt's 'Traité d'Ophtalmologie,' that it is easy to differentiate between retinal and choroidal hæmorrhages in the region of the macula. If the former, it will give rise to a positive scotoma ; if the latter, to no functional derangement. Therefore in all these cases the extravasation must have been in front of the retina, otherwise it would not have interfered with the vision nor have made objects look red.

Referring to large hæmorrhages, De Wecker says, "These extravasations spread out by preference towards the posterior pole of the eye, the macula, push on one side in their passage the transverse fibres of the retina, and thus create for themselves, by the heaping-up of these fibres, lines of demarcation more or less straight or curved, and have always a tendency to denote by their colouration the deposit of the consistent parts of the blood in the most dependent part of the eye."

I think this explanation is very untenable, as one can hardly imagine a large hæmorrhage tearing up the retina into two layers at the yellow spot, then absorbing and

leaving the vision perfect. It is to my mind much more reasonable to suppose that the hæmorrhage takes place between the internal limiting membrane of the retina and the hyaloid membrane of the vitreous.

I am indebted to my colleague Mr. Gunn for an explanation of the anatomical arrangement of these parts at the macula, which I believe will satisfactorily explain the beautifully circular contour of these hæmorrhages.* Mr. Gunn has been led to believe, from the microscopic sections he has made, that the hyaloid is not adherent to the internal limiting membrane at the macula. If this is correct, a hæmorrhage from a large vessel, such as doubtless is the source of these extensive extravasations, would be limited in this way by the hyaloid, which is very adherent at the posterior pole around the macula.

The disappearance of the large retinal vessels, the positive scotoma which gives place on recovery to perfect vision, the peculiar streaked appearance described by Mr. Morton as being retinal, but which I consider as being due to disturbance of the hyaloid, are all satisfactorily explained if it is granted that the hæmorrhage takes place between the retina and vitreous.

As a point in the prognosis in these cases, I would suggest that where a bright lamp-light appeared red the hæmorrhage was probably in front of, and not in, the retina, and therefore after absorption the vision would be restored. (*March 8th*, 1888.)

Mr. Hulke suggested that, inasmuch as the vascular system of the retina is not limited in its distribution to the inner layers, but capillaries pass outwards as far as the layer of the outer granule, it was not probable that all hæmorrhages in the central region of the retina occurred at the same depth.

Mr. Silcock thought that De Wecker, in the article referred to by Mr. Lang, had described and figured a

* Mr. Gunn has informed me since I read this paper that he has held and taught this view for some years although he has not published it.

case of choroidal hæmorrhage in which the blood was effused into the so-called endothelial spaces of Sattler. In the case he had described in the last volume of the 'Transactions,' of which Mr. Lang had spoken, he had called the hæmorrhage choroidal because the latter had occurred at a spot where the retinal vessels were of very small calibre. His patient had a small negative central scotoma; he was not aware that she had complained of a red coloration of objects as seen with the affected eye. As had generally happened in these cases, the effused blood had almost entirely disappeared, only a few small white spots remaining to indicate its position, and these, he thought, were due to the presence of decolorised fragments of clot which were as yet unabsorbed.

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8. *Chronic retinitis with formation of blood-vessels in the vitreous in a patient with diabetes. One eye lost by results of chronic iritis accompanied by the formation of large vessels in the iris.*

By E. Nettleship.

The patient, Charles O—, æt. 48, a drayman, seems to have lost flesh about four years ago, and between two and three years ago to have noticed that his urine was very abundant (six to eight pints a day). About that time (April, 1885) his sight became dull, so that he could only see large objects, and he obtained advice at an ophthalmic hospital, where his urine was examined, and he was told that it contained sugar. He remained under treatment for eight months, and got better and stronger. His sight, however, has not improved. There is no history of inflammation or pain in either eye. No

history of gout or venereal disease. In September (1887) he was admitted under the care of Dr. Stone (who allows me to use the case) into St. Thomas's Hospital, and whilst there has passed from 100 to 150 oz. daily of highly saccharine urine, having sp. gr. of about 1038. His eyes have been examined several times since he came in, and the appearances at the fundus (of the R.) have not changed. The L. is quite blind from glaucoma secondary to chronic plastic iritis with blocked and excluded pupil and bulged iris. In connection with the vascular changes described below in the R. fundus it is of interest that several much enlarged vessels are easily visible in the iris of the L. eye.

The R. eye, with which he can only see very large objects, is affected with retinitis complicated by hæmorrhages, and by the formation of blood-vessels in the vitreous. Over the whole of the central region the retina is œdematous and hazy, in some parts densely cloudy; near the y. s. are some densely opaque yellowish-white clumps of deposit, such as have been described in other cases of diabetic retinitis (these 'Transactions,' vol. vi, p. 331); the retinal veins are considerably distended, and in various parts are a few scattered blood-spots. Close to the fovea centralis two or three vessels of medium size suddenly appear in the retina; they cannot be followed to the o. d., but have every appearance of springing from the choroid directly into the retina. The largest of them (seen at its apparent emergence from the choroid with + 2·5 D.), followed upwards and outwards, is found to divide into a network of minute vessels, which project forwards in the form of fine loops into the vitreous, where the most prominent of them are seen with + 6 D.; on a few of these loops an appearance of small swellings, perhaps capillary aneurisms, can be distinctly seen. The appearances described were pointed out to me by Mr. Roll soon after the patient's admission, and had not altered when the above description was written on the 7th inst.

(*Card specimen. October 20th,* 1887.)

P.S.—Dr. H. W. G. Mackenzie informs me that no albumen was ever found in this patient's urine, and that he had a perforating ulcer of the left heel with absence of left knee-jerk.

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9. *Hæmorrhagic retinitis in a patient with diabetes; varicose swellings on a retinal vein in the R. eye.*

By E. Nettleship.

Charles G—, æt. 58, a carrier, began to be very thirsty, to lose weight, and to pass much urine three or four years ago, and after medical examination was told that he had diabetes. His health remained, he thinks, pretty good till a year ago, when he was again told that he had sugar. About this time one of his toes became bad after he had cut the corn upon it. Last April (1887) two toes became gangrenous (black) and were removed. In August he was admitted into St. Thomas's Hospital under the care of Dr. Stone, who allows me to bring the case forward. The urine contains sugar. He states that seven years ago he had erysipelas of the face, was delirious and lost his whiskers.

The patient sees well, but Mr. H. P. Hawkins, Dr. Stone's house physician, found numerous retinal hæmorrhages very soon after admission. On 7th instant, I found hæmorrhages of various sizes and shapes, some flame-shaped but the majority rounded, scattered irregularly over all parts of the fundus of each eye. There were no white patches, and with the exception of some haze about the y. s. in the R., no evidence of œdema of the retina; the o. ds. also were almost clear. In the R. also were a few dots of cholesterine situated in the hinder part of the vitreous; and a venous branch of

considerable size passing upwards from the main upper division of the vena centralis showed a number of small dilatations which gave the vessel an imperfectly beaded appearance.

(*Card specimen. October 20th,* 1887.)

P.S.—Remained in hospital two months. Daily discharge of urine about three and a half pints; it repeatedly contained a trace of albumen as well as sugar, and sp. gr. was never higher than 1021.

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10. *Retinal hæmorrhage.*

By Robert W. Doyne.

Patient, a gentleman about 40, suffering from cirrhosis of the liver and marked anæmia, noticed an appearance suddenly of a bright loop like the luminous thread of an electric incandescent lamp, which was rapidly followed by loss of distinct vision. Perception of light remained, but seemed red, and there appeared to be an object constantly before his eye. Ophthalmoscopically, a semicircular hæmorrhage was visible occupying the exact position of the fovea centralis, the oval reflex of which could be distinctly seen in the retina in front of the hæmorrhage. The straight edge of the hæmorrhage was very sharply defined. Immediately above this was a smaller circular hæmorrhage, in this respect resembling a case shown last year by Mr. Jessop. Below and to the inner side of the O. D. was an ill-defined patch of choroidal atrophy besides other lesser changes. On being asked to draw an outline of the object he saw before his eye, the patient sketched a semicircle, himself remarking that the straight edge was very sharply defined. His semicircle was an inverted reproduction of that formed by the hæmorrhage.

V. R. = P. L.
L. = $\frac{6}{6}$.

This occurred in the middle of last March. A few days later the hæmorrhage was mulberry shaped and less well defined.

On examination two days ago, without atropine and consequently very imperfectly, as the pupil was very sensitive to light thrown on the macula, no remains or consequences of the hæmorrhage could be made out. The patient described his sight as completely restored, and vision of both eyes was rather less than $\frac{6}{6}$ in a bad light.

If the hæmorrhage was in the retina, it must have been in the deeper layers. If the source of the hæmorrhage was retinal could such complete recovery have taken place? Might not the source of the hæmorrhage have been choroidal, the blood having burst through into the retina? Has the smaller hæmorrhage anything to do with the larger?

(*Card specimen. October 20th,* 1887.)

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11. *A case of stationary night-blindness with minute white spots at the fundus.*

By E. Nettleship.

(With Plate VII, fig. 2.)

The following case exactly resembles the cases, four in number, recorded by the writer at p. 301 of vol. vii of the Society's 'Transactions.'

Edward B—, æt. 21 (P. 15, 116), came to me in November, 1887, complaining that he could not see well in the dusk. He had had this difficulty as long as he could remember, but was under the impression that it had been diminishing for the last few months. The

evidence on the last point was not conclusive, but he thought that lately objects in the peripheral parts of the field were seen better than those at the centre. He said that he went to the Moorfields Hospital about eight years previously, and was told that his sight would not improve. The same opinion was given four years later by the late Mr. Streatfeild ; some weak glasses were ordered, but he did not find them of use.

He is a healthy lad, helping his father, who is a farmer. He had measles at four, and "inflammation of lungs" at seven ; has not had scarlet fever ; intelligence good ; all the organs healthy.

With R., V. = $\frac{6}{9}$ slight H. As., but cannot be got to see $\frac{6}{6}$. L., V. = $\frac{6}{12}$, refraction as in R. ; Ps. and T. n.

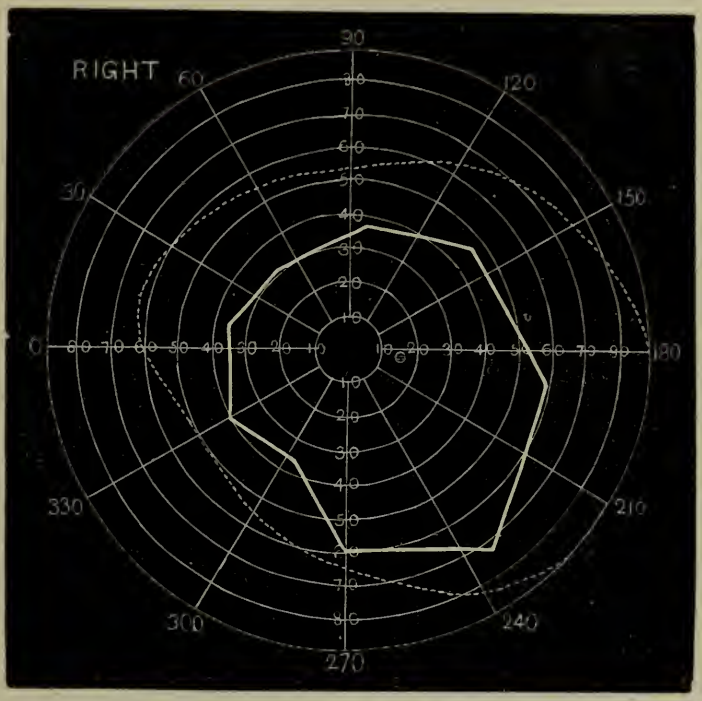
Colour perception n. Oph. appearances identical in both. The central part of each fundus pretty thickly scattered with single, separate, minute white dots evenly distributed, not grouped, and quite free from pigment ; they come close up to the fovea centralis ; the choroid on which they lie looks perfect.

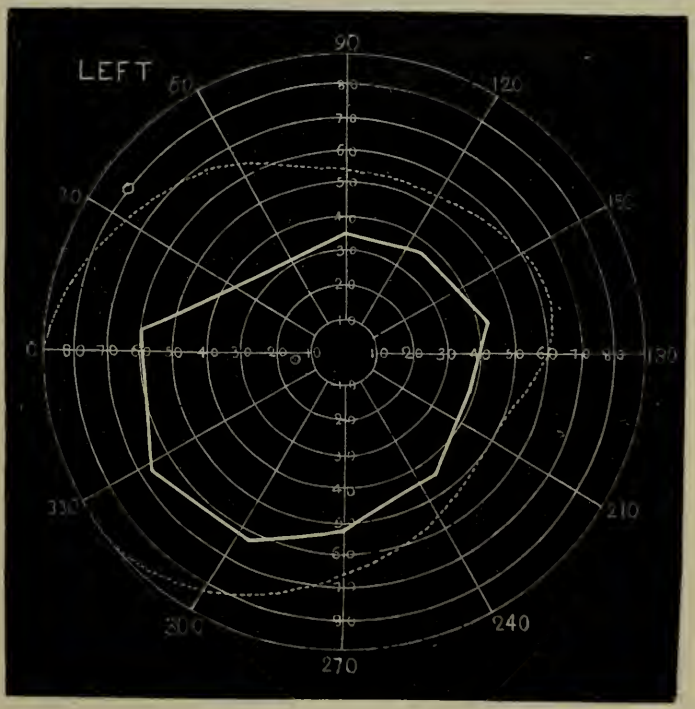
Not far beyond the region enclosed by the macular vessels, however, the white dots thin off and the choroid begins to show changes, its large vessels becoming visible and its surface looking granular. Further towards the periphery the choroid is even paler, and a little granular pigmentation is apparent. Nowhere, however, is there anything like retinitis pigmentosa. O.Ds. slightly hazy, but vessels n.

The granular choroidal changes seem to be partly the result of the confluence of the minute separate dots, but in some places there is a narrow zone of perfectly healthy fundus between the dotted and the granular regions.

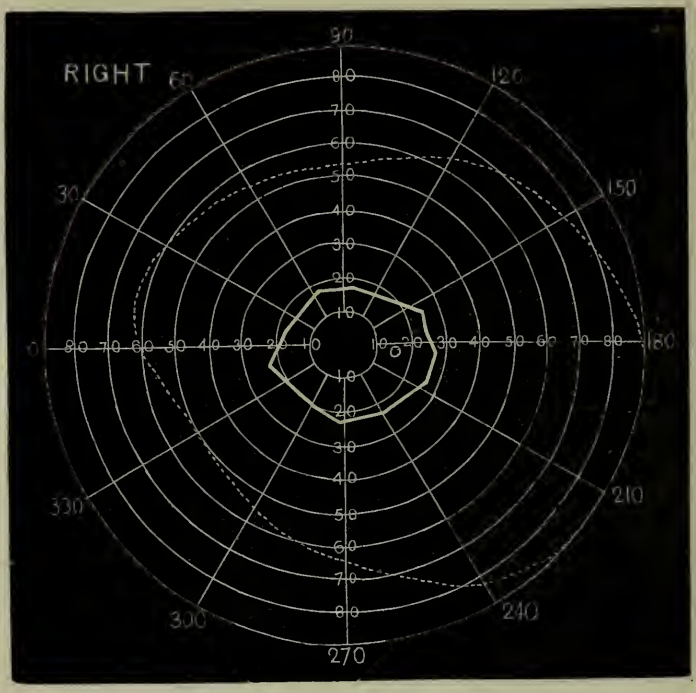
The fields of vision were carefully taken by Mr. H. A. Sansom in daylight, in good gaslight, and in very dim gaslight, respectively, a 5 mm. square being used as a test in all the observations.

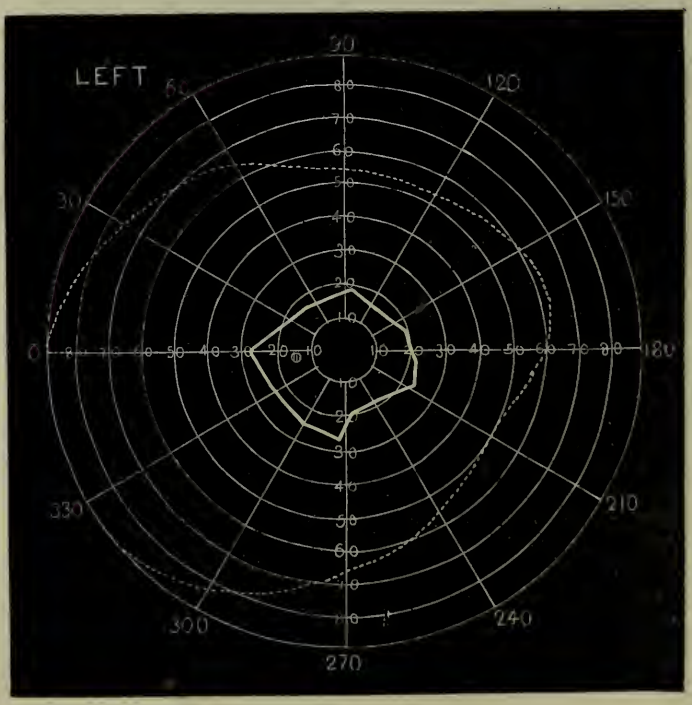
The appended charts indicate that the fields, which showed considerable concentric contraction even by day-





The above charts were taken in daylight.





Charts taken in a dim gaslight.

light, and about the same in good gaslight, were very much smaller in a dim gaslight.

Family history.—His parents are second cousins. He is the second of ten born alive, of whom six are living; of the six, two are males, four females, and one of these a sister, aged 14 (the sixth born), is reported to have exactly the same defect as the patient himself, so that on winter afternoons she cannot see to come home alone from school; none of the others seem to have the same defect; but one sister, aged 12, is said to be near-sighted. The four others in the family, all males, died in early childhood (the third, fifth, seventh, and ninth).

The patient's father and mother see perfectly.

A sister of the father is said to have defective sight, but this is probably only presbyopia. Two male ancestors on the father's side had senile cataract. In other respects the family history is negative.

(*Card specimen. December 8th,* 1887.)

Mr. Silcock asked Mr. Nettleship if he did not consider the ophthalmoscopic appearances depicted in the drawing which he showed as being of a similar kind to those figured and described by Masselon under the name of choroidite vitreuse. He described the ophthalmoscopic characters of a case—a woman, aged about thirty-five—which had been under his observation for more than one year, in which the vision, after refractive correction, was normal, and in which disseminate spots existed about the posterior pole of both eyes, only differing in their topography from those represented in Mr. Nettleship's cases. He considered that the latter case came under the same category as those of Masselon.

Mr. Juler remarked that in his opinion the white dots represented in the drawing were similar in nature to several cases he had recently observed, but in his cases no night-blindness was present, nor was the vision defective.

Mr. Adams Frost had had two cases similar to those

mentioned by Mr. Juler under observation for several years, but like Mr. Juler's cases they differed from Mr. Nettleship's in the absence of night-blindness or indeed any impairment of vision, and in the dots being most numerous near the posterior pole of the eye.

Mr. Nettleship.—The observations that have fallen from Mr. Silcock and Mr. Juler show how very difficult it is to get a really good ophthalmoscopical drawing, for I am sure that if Mr. Silcock had seen the patient from whose eye my drawing was made, he could not have confused the changes with those shown in Masselon's illustrations. Masselon's cases, by the way, are clearly the same as those that we have for so long known in this country as "Tay's Choroiditis," and which are well illustrated in vol. iv, pl. ii, of our own 'Transactions' (1884). Nor are the appearances in my cases like those represented in a case published by Mr. Juler in the same volume (pl. iii, fig. 2). But apart altogether from appearances, the general characters of the disease to which Mr. Silcock refers are radically different from those in the cases I have shown to-night. The "guttate central choroiditis" of Tay, or "Infiltration Vitreuse de la Rétine" of Masselon, is a disease of advanced life, usually limited to the central region of the fundus, often causing no defect of sight, never giving rise to night-blindness or contraction of visual field, and showing no special tendency to affect more than one member of the family. The peculiar malady illustrated by my drawing always dates from early childhood (if not from birth), gives rise to changes at the periphery of the fundus which are more gross than, though not so striking as, those at the more central parts, always causes marked contraction of field and night-blindness, usually (so far as recorded cases yet show) affects at least two children of the same family, and appears to be stationary.

Postscript.—During the last few years cases have been recorded abroad under the term "retinitis punctata albescens," some of which doubtless correspond with the

disease described here and in the preceding volume of the Society's 'Transactions,' whilst others are certainly examples of different maladies. The term seems to have been first applied by Mooren in 1882 to the case of a man, aged 30, seen in 1868, whose eyes presented "hundreds and hundreds" of dull white spots "as if the sclera were shining through minute openings punched out of the retina and choroid." V., which had been slowly failing for years, is said to have improved under treatment; afterwards both sight and ophthalmoscopical appearances remained stationary for several years. Mooren expressly states that, though V. was (when the patient first came) scarcely $\frac{1}{10}$, the fields were perfect both by daylight and artificial light.

In the absence of night-blindness, the high degree of direct amblyopia, and the improvement of vision under treatment, the case differs essentially from those recorded by myself.

Mooren mentions having seen a drawing of a case, under the care of Kuhnt, apparently of the same nature.

I am indebted to my friend Dr. G. Berry for referring me to two cases exactly like my own which were published by Gayet in 1883. Gayet's two cases, which are exceedingly well recorded, are illustrated by ophthalmoscopical plates that still further confirm the identity of the disease with that we are describing to-night. The patients were brother and sister. *The brother*, a young man, had been night-blind since childhood, and had some colour defect for green and red, with contraction of F., and V. defective (but it is not stated whether his M. As. of 2 D. was corrected when the trial was made); his hearing was good, but he had never been able to learn, nor even to repeat after another person, even a couple of notes of the simplest tune; he was intelligent, with good teeth and black hair; he was the second in a family of five, and the fourth (f.) was affected in exactly the same way as himself; his parents, alive and well, were first cousins; no deaf-mutism or other congenital defects in the family; his

mother's brother had very bad sight, and her father was blind some months before he died at the age of seventy.

The fundus of each eye was spotted over with "an immense multitude" of white dots, almost as white as in albuminuric retinitis, but differently arranged and always deeper than the retinal vessels; no pigmentation; retina "greyish," especially so towards the periphery. No changes at y. s.

Gayet suggests that the white dots are arranged in relation to the meshes of the chorio-capillaries, and are due to some peculiar change in the cells of the pigmented epithelium, and that the disease may be set down as a rare variety of retinitis pigmentosa.

Gayet's *second patient* was the younger sister of the above, and was aged 13. She was also partially colour-blind and quite incapable of appreciating musical tones. Her eyes showed appearances closely similar to those in her brother, and at the periphery there were changes in the distribution of the pigment resembling, in some places, the changes of "true retinitis pigmentosa."

Dor has also recorded a case which must, for the present, be placed in the same group. A young man of twenty-one had been blind at night since he had small-pox at the age of four or five. V. was now $\frac{20}{30}$ in day-light, but only $\frac{20}{100}$ in dull light (though in the same dull light other people had $\frac{20}{20}$). The fundus from the back of the eye to the equator was greyish white, and at the anterior boundaries of the greyish part were a number of scattered, clearly defined, grey points; disc and retinal vessels normal; periphery of fundus of natural red colour. Dor thinks that the changes probably had their seat in the pigment layer of the retina.

References.

Mooren.—Fünf Lustren Ophthalmologischen Wirksamkeit., 1882, p. 216.

Gayet.—Archives d'Opht., t. iii, p. 386 (1883).
Dor.—Ibid., p. 481.
Burnett.—Knapp's Archives, xii, i, 22 (1883).
Hirschberg.—Referred to in Knapp's Archives, xii, ii, 289 (1883).

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12. *Results of embolism of a branch of arteria centralis retinæ, in a patient with aortic disease.*

By Poulett Wells.

Twelve months back the patient's sight failed in the R. eye while she was sitting at tea. On examination of the fundus, four days later, there was distinct ischæmia of a part of the retina extending outwards and slightly upwards from the disc, its lower margin being very clearly marked off from the adjacent retina by abrupt change in its colour. On looking carefully at the arterial branch supplying this portion of the retina it was seen to become almost untraceable from the edge of disc to its entry into the fundus. A vein coursing above the artery was distended. The macula could be made out as a dark spot just below the abrupt margin of the ischæmia, and beyond this again there were some small vessels descending vertically towards the macular region, with a line of haze along their borders. On following the ischæmia outwards towards the periphery the fundus reflex becomes normal in colour. There was no perception of light over the ischæmic portion. The field of vision was taken, and showed for the first few weeks a slight improvement, but latterly a slight decrease.

Present appearances are: The upper temporal branch of retinal artery is very much diminished in calibre for a distance of about two disc-diameters, where it enlarges; the upper nasal branch is slightly smaller than the lower nasal

branch. The whole disc is intensely white, especially its outer half. She can count fingers in certain positions, *i. e.* when held above the eye, to its outer side, and also when held slightly below its horizontal meridian. The patient has aortic disease.

(*Card specimen. November 10th,* 1887.)

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13. *Semicircular hæmorrhage, not in the region of the macula.*

W. P. Keall.

Tom B—, æt. 34, cab proprietor and driver. Had syphilis seven years ago. Admitted into the Bristol General Hospital September 8th, 1887, with well-marked double optic neuritis. Disc enlarged, swollen vessels disappearing under exudation, and reappearing on and beyond disc; in places showing no central reflection. Various flame-shaped hæmorrhages on and around disc.

October 6th.—Some hæmorrhages have been absorbed and others have appeared from time to time. To-day there are some fresh ones of considerable size, flame-shaped, outside and below disc.

11th.—The semicircular hæmorrhage, as described below, first noticed.

Present condition.—Neuritis subsiding. Vessels seen plainly over their whole course except when they emerge from the disc, where they are hidden by white tissue. This white tissue is well marked, running at the sides of the vessels over, and in some instances beyond, the disc. The large vein running downwards is still partially obscured for some distance from the papilla, and the white tissue is especially well marked on its outer side in this situation. Below and a little to the inside of the disc is a large semicircular hæmorrhage with a sharp, straight

outline above, and a curved bulging outline below, as if the greater part of the blood had been drawn downwards by gravitation. This hæmorrhage, although smaller, is of the same shape as that in Mr. Stanford Morton's case of hæmorrhage in the region of the macula ('Trans. Ophth. Soc.,' vol. iv, pl. iii), but its different situation seems to point to the fact that the structure of the retina in the region of the maculæ is not the only cause of a retinal hæmorrhage assuming this shape.

V. $\frac{6}{9}$. Urine, sp. gr. 1010, acid, no albumen.

(*Card specimen. November 10th*, 1887.)

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14. *Peculiar foveal reflex in connection with amblyopia in myopia.*

By R. Marcus Gunn.

This case is shown as illustrating a class of cases of myopia, in which the full correction with glasses gives imperfect vision, without any gross fundus disease being found to account for the amblyopia. On examining by the direct method we not infrequently find in such cases that the centre of the macular region is conspicuous by the presence of a particularly bright reflex, of a fan shape, with its apex at the fovea, the base of the fan extending in the opposite direction to that from which the region is illuminated. In well-marked examples the reflex is quite metallic in brilliance, and seems to extend a short way into the vitreous.

The appearance is possibly accounted for by some unusual disposition of the fovea, either in its shape or degree of excavation; or by a localised detachment of the hyaloid membrane with the intervention of a turbid fluid between it and the retina.

The patient is aged 12 years, has myopia about 9 D., and

with best correction gets $\frac{6}{18}$ partly with each eye. I have previously alluded to this condition in a short paper in the 'Roy. Lond. Ophth. Hosp. Rep.,' vol. xi, p. 348.

(*Card specimen. December 8th,* 1887.)

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15. *Pigmentation of the retina.*

By J. B. Lawford.

(With Plate VIII, fig. 1.)

Sarah D—, æt. 23, admitted 29th June, 1887, under Mr. Gunn's care at Moorfields.

L. injured by a penknife ten years ago, and has been blind since that date. It gave no pain or trouble till Christmas, 1886. Two weeks ago she received a blow on the eye with a piece of wood, and has been in great pain since. Right eye never affected in any way.

L. Scar of wound and opacity in cornea. A small cystic swelling beneath conjunctiva of lower ciliary region, formed by a communication with the anterior chamber, allowing escape of aqueous beneath conjunctiva. Iris adherent to the corneal scar, and to lens capsule. Lens shrunken and opaque throughout. Vitreous fluid.

At lower and inner part, anteriorly, there is a large area of partial atrophy of choroid, with irregularity of pigment, and some-well marked pigmentation along retinal vessels. Near ora serrata on temporal side is an isolated patch of nearly complete atrophy of choroid, with pigment accumulation at its margins. No other naked-eye change.

The portion of retina alluded to was cut out and spread on a slide, mounted in glycerine. The pigmentation along its vessels is thus shown (microscopically) extremely well. The pigment, which is chiefly in the line of large vessels, but to a certain extent along small vessels,

DESCRIPTION OF PLATE VIII.

Illustrating Mr. Lawford's cases. From photographs.

Fig. 1.—A portion of the Retina from the Eye of Sarah D— (p. 174), showing the mapping out by pigment of the retinal vessels. From a photograph by Mr. E. C. Green.

Fig. 2.—A Vertical Section of the Choroid and the Connective-Tissue Mass on its Inner Surface, from the Eye of Mary R— (p. 178). The arrangement of the tissue elements is not shown in the plate, although quite visible in the original photograph, which was taken by Mr. E. C. Green.

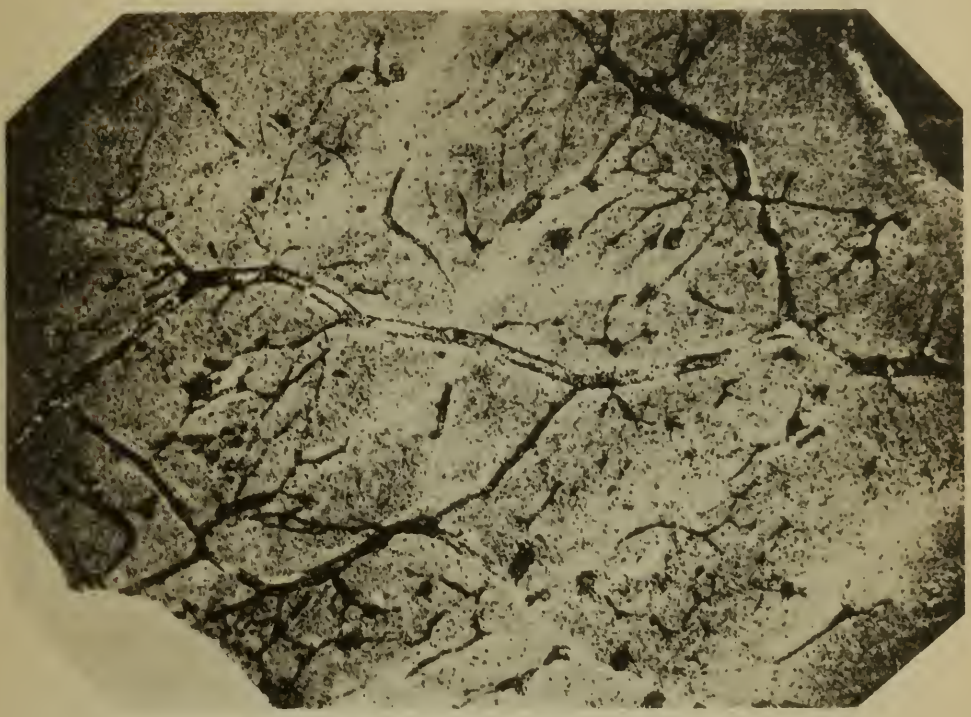

Fig. 1.

Fig. 2.

From Photographs

Danielsson & Co., Photo Print.

consists of granules which when seen singly are dark brown in colour, but in mass are black. These granules are usually enclosed in cells, most of which are round or oval, but occasionally they are irregular and polygonal. Some granules appear outside the cells, but this is probably a post-mortem change. These cells are unevenly distributed along the vessels, some parts of which are seen to be almost devoid of pigment, while in others nothing but pigment can be seen. The cells are apparently in general in the walls of the vessels, though it is impossible to be sure of this in a preparation of retina on the flat; in some parts, however, they look as if clinging to the walls, without having yet penetrated.

(*Card specimen. May 3rd*, 1888.)

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16. *Two cases of cicatricial changes in the retina and vitreous.*

By J. Hutchinson, jun.

In the two cases there are very conspicuous white scars in the retina reaching forwards into the vitreous, both in the neighbourhood of the yellow spot and involving great defect of sight. The lesion is uniocular and the cause obscure in both.

1. Sidney B—, æt. 9, not known to have had any illness whatever. His mother has had ten children, of whom two died from measles and scarlet fever. No suspicion of congenital syphilis. At the age of three years he injured his forehead, and there is still a scar, but a long way from the eye. He came to Moorfields for defect of the left eye, with which he counted fingers, but could not read 20 J.

Right eye $\frac{6}{6}$, fundus normal.

In the *left eye*, above and to outer side of disc, is a diamond-shaped brilliant white patch of scar tissue with fine bands running into the vitreous and in various

directions in the retina. Optic disc normal. The patch is considerably larger than the disc, and both its position and aspect (coming forwards into the vitreous) negative the idea of coloboma. Just behind the lens are numerous spotted opacities in the vitreous. Some of the retinal vessels curl round the edge of the white patch.

2. Finetta J—, æt. 14, was noticed to have defect of the left eye when aged 9. She suffered from scarlet fever one year previously. There are two brothers and four sisters; none of them have any defect of sight.

V. L. 20 J.
R. $\frac{6}{6}$ 1 J.

L. eye. Thin whitish band placed nearly vertically in the vitreous, coming forward to the lens, where it is most defined; posteriorly it becomes more hazy; going back towards the disc, its connection with the central vessels cannot be clearly made out. Running outwards from the disc, and above the yellow spot, is a bright white band coming somewhat forwards into the vitreous; below this a yellowish-white circular patch in the choroid with considerable pigmentation. The perivascular sheaths are in places well marked, and there are some small patches of pigment near the chief white ones, which exactly occupy the central region.

In both cases the real nature at the commencement was probably inflammatory or tubercular, the second case pointing more strongly to this than the first.

(*Card specimen. June 14th*, 1888.)

IX. DISEASES OF THE CHOROID.

1. *Colloid disease of choroid?*

By E. Treacher Collins.

Eliza H—, æt. 74, admitted at Moorfields Eye Hospital under Mr. Lawson on February 16th, 1888, complaining of failure of sight for the last three years. Her general health is good, her finger-joints are swollen from rheumatoid arthritis. She states that her father and mother lived to seventy-six and eighty-six respectively and died of "old age." She has had eleven children, of whom seven are living; one was stillborn, and three others have died, one aged fourteen months.

There is no history of syphilis.

R. and L. pupils are equal, but act sluggishly to light and accommodation; there are striæ in both lenses.

Ophthalmoscopic examination shows, scattered all over the fundus except around the yellow spot, and arranged chiefly though not entirely along the vessels, circular and oval greyish dots varying in size, the smallest are broader than the vessels, and the largest nearly three times the width; they look like oil-globules and are seen to be distinctly behind the retinal vessels.

R. V. = 20 J., counts fingers at two feet. Hypermetropia estimated to be + 4 D.

L. V. = 20 J., counts fingers at two feet. Hypermetropia estimated to be + 3 D. Fields in both eyes normal.

(*Card specimen. March 8th,* 1888.)

2. *New tissue formation on inner surface of choroid.*

By J. B. Lawford.

(With Plate VIII, fig. 2.)

Mary R—, æt. 18, admitted March 3rd, 1887, under Mr. Couper. The sight of the left eye "went away suddenly" fifteen months ago after gradual failure for nine months. The eye has not been painful or in any way troublesome till a few days ago.

On admission, R. My. − 1·5 D. V. = $\frac{20}{20}$. L. No. p. l. T. + 2. Cornea hazy, A. C. shallow. Iris discoloured, posterior synechiæ. Yellow opacity deep in eye on nasal side.

Left eye after removal.—Anterior part of the eye normal, with the exception of several posterior synechiæ. Infundibuliform detachment of retina, the subretinal space filled by a thick brown fluid containing large quantities of cholesterin and a little blood-clot.

Down and in from O. D., is a long narrow patch in the choroid, greyish white in colour, smooth on the surface, and slightly raised above the surrounding choroid. The strip is about 2 mm. broad and 6 or 8 mm. long. Elsewhere the choroid shows no naked-eye change.

Microscopical examination.—Sections of the white patch on the choroid reveal a new growth on the inner surface of that tunic. The choroid beneath shows some small cell accumulation in places, but generally is thin and almost entirely devoid of pigment. The new growth is very intimately connected with the choroid, being apparently directly continuous with its stroma in parts, but in others merely lying upon the inner surface of the choroid. The lamina vitrea is absent over the greater part of the area occupied by the growth, but in some places it can be recognised between the growth and the choroid.

The new formation has a wavy fibrillated structure, and is composed chiefly of fibres and long fibre-like cells with

fusiform nuclei. In parts it is undergoing some degenerative change, and the structure loses its characteristics and becomes homogeneous in appearance. In one part appearances suggestive of commencing ossification can be seen. There is a moderate amount of pigment in certain parts of the growth, but not enough to give a colour to it when seen unmagnified. The surface of the growth is slightly irregular and has a frayed appearance, perhaps due to manipulation in preparing the sections. The arrangement of fibres in some parts of the growth is very peculiar, a circular disposition being plainly visible in the central part, apparently quite distinct from the part behind and in front of it.

The choroid elsewhere is not inflamed, but near the O. D. there are evidences of proliferation of the hexagonal epithelium cells. This layer is completely destroyed beneath the new growth.

(*Microscopical specimen. May 3rd,* 1888.)

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3. *Localised tuberculosis of the choroid; enucleation, and recovery.*

By M. M. McHardy.

Solitary cases rarely deserve record, but I am induced to make an exception in respect to the following case on account of the infrequency of such examples of the affection, of the close observation of the general symptoms and local changes several months before and immediately prior to enucleation, of that marked improvement of general health which promptly followed a complete removal of the local disease, and of the corroboration the facts of the secondary extensive retinal detachment furnish to Erik Nordenson's valuable contribution* concerning the pathology of such detachments of the retina.

* Reviewed by Priestley Smith, 'Ophth. Review,' vol. vii, p. 41.

Localised rather than *primary* is stated in the title of this case, as its previous history at least suggests the suspicion that the subject had recovered from an attack of localised tubercular peritonitis. I am quite alive to the support this suspicion derives from the facts revealed in connection with that subsequent eye disease which now engages our particular attention. Nevertheless, it would be little better than quibbling to dispute whether or not this intra-ocular tubercle was or was not *primary*. However, it certainly was *localised*, and occurred at a time when the most careful physical examination of the patient failed to reveal any other manifestation of tubercle. Moreover, during the attack of illness which, from the subsequent history of the case may be suspected to have been tubercular, the patient was in a children's medical ward under the critical skilled observation of a physician who discussed the possibility of the mischief being tubercular, but did not feel warranted in making that diagnosis.

The rarity of localised tuberculosis of the uveal tract may be judged from Hirschberg recording only three cases amongst 17,000 eye patients, Horner one in 4000, and Mules one in 33,000.

Louisa T—, æt. 6, was sent by Dr. Sandford Arnott to me, at King's College Hospital, in November, 1887, stating that the left eye had lately become blind.

Family history.—Both parents living; the mother enjoys good health, has had ten living children, of whom three have died (viz. one through dysentery, one with "consumption of the bowels," and one from a cause not stated); the mother has miscarried thrice, but, as she suggests, more probably from domestic straits than from constitutional causes. The father usually follows his trade, though his mind is affected at times, and he has more than once attempted suicide. An inspection of the patient's brothers and sisters, and a searching review of the family history, afford no further evidence of either a syphilitic or a tubercular taint.

Personal history.—This patient had enjoyed capital health till January, 1886, when she took whooping-cough, which tried her very much, and from which she was judged to have never recovered completely.

In October, 1886, she was an out-patient at the Evelina Hospital on account of pain in the right loin and enlargement of the abdomen, with malaise, anorexia, constipation, flatulence, and scantiness of urine; no œdema of feet or face.

In March, 1887, she was admitted to the Children's Ward in King's College Hospital, under the care of my colleague Dr. Hayes, to whom I am indebted for the following summary of the notes taken there when she was admitted, and noted to be a thin, ill-nourished child, with enlarged glands at the angles of the jaw, in the groins and axillæ, but without scrofulous cicatrices.

Abdomen much enlarged, considerable amount of fluid in the peritoneal cavity (but without ascertainable causation); heart-sounds normal; lungs normal except for a few râles at the bases; liver not demonstrably enlarged; urine scanty in quantity, but always free from albumen, though repeatedly and thoroughly examined. Temperature about normal, but somewhat irregular. Treatment by diuretics and hydragogue purgatives during a fortnight, while the patient improved nothing, and her temperature became more irregular, rising in the evening to 100°—103°.

The treatment was now changed to cod-liver oil with iodide of iron, and a slow improvement, with a gradual subsidence of all the symptoms, set in forthwith. In May she was well enough to visit a Convalescent Home, where she remained four weeks, and on her return was noted as being fat, healthy, and without any abnormality about the abdomen.

In November, 1887,—The child looks well nourished and rosy, but somewhat puffy in the face.

Urine, sp. gr. 1010, free from albumen and casts. Her left eye, without perception of light, reveals on ophthalmoscopic examination appearances in the real lower part

of the fundus just like those with which we are familiar in the region of the macula lutea as depending upon fatty degeneration at a late stage of albuminuric retinitis; optic disc normal; refraction emmetropic.

Right eye absolutely normal.

Two weeks later.—The ophthalmoscopic morbid appearances have altered. The white patchiness is now a definitely raised, apparently rounded, single mass; white, grey, and in parts dark looking, with retinal vessels running *over* it. The erect image of its anterior portion is seen clearly with + 5·00 D. Repeated examinations of urine give results identical with those recorded above. Pulse 130, temperature 99·6° F. Is the mischief tubercular, syphilitic, or due to a cysticercus? A syphilitic causation is not supported by the history, but would warrant the best prognosis. Anti-specific treatment prescribed to facilitate a correct diagnosis.

One week later.—The intra-ocular subretinal mass much larger; its anterior portion now seen clearly with + 9·00 D. Constitutional condition unchanged.

Four days later.—Further increase of mass; retinal vessels course *over* it; it appears white, and greyish or darkish in different places; it rises with a regular, somewhat abrupt curve from the surface of fundus above itself. Anterior portion now distinct with + 11·00 D. The margins of optic disc growing hazy with some slight opacity of retina immediately above disc. Between the disc and the mass there are three distinct, isolated, minute patches of white opacity remarkably like the abruptly defined, limited areas of retinal œdema seen in early albuminuric retinitis, but having a more tissue-paper-like than packed-cotton-like whiteness. The smallest of these three patches is positively *anterior* to the branch of a retinal vessel. *Tension definitely increased.* Fellow eye appears sound. Anti-specific treatment abandoned as the disease increases rapidly in the face thereof.

December 7th, 1887: *Two days later than last note, twenty-seven days after I first saw her.*—Everything

noted two days ago is more emphasised to-day, and the surface of the mass is now seen well with + 12·00 D.

General anæsthesia having been induced by administration of A. C. and E. mixture, the eye was enucleated and immediately placed in Müller's fluid, its optic nerve having been divided well back from the globe.

This enucleation of the affected eye proved a most happy turning point in the case, which forthwith rapidly improved, the child's temperature, pulse, appetite, and disposition becoming normal in the course of from two to five days. I have seen the child from time to time since and no morbid change has been discoverable, and her regular medical attendant, Dr. Sandford Arnott, writing on July 19th, 1888, says,—"I saw the child yesterday, she remains *in statu quo;* I examined chest and found no physical signs. She continues in good condition, but has an irritable cough."

As in practice we have to wait for a histological verdict on the specimens we secure, so it may seem convenient to postpone a record and discussion of such verdict on this specimen until after we have considered the clinical aspect of this and kindred cases with which we have of necessity to adopt radical measures, guided alone by clinical and non-microscopical observations, if we are not to lose the opportunity for doing what is best for the patients.

The grounds for enucleating may be summarised thus:

1. To relieve the child of the suffering associated with the too probable disorganization of the eyeball by a rapidly increasing intra-ocular mass.
2. To secure the specimen.
3. To settle the diagnosis.
4. To extirpate an easily isolated definite centre of fresh general infection if the mass were tubercular; for it is now well recognised that most cases of primary tuberculosis of the eye, when left untreated, have proved fatal by general tuberculosis, or tubercular meningitis, or tubercular phthisis.

The diagnosis obviously was not clear prior to the

enucleation, and we may perhaps usefully review the more prominent explanations of the intra-ocular mass as they were respectively suggested.

If œdema, why confined to one eye? why preceded by blindness?

Cysticercus? How is this consistent with the patchy early appearance at the seat of the mass, or with the subsequent isolated distinct developments, or with the absence of all undulatory movement of the surface of the mass?

Syphiloma might be a convenient explanation. It is one not strongly supported by the family history, and is almost negatived by the rapid growth of the mass during the time that the child was under active specific treatment.

Tubercle certainly seemed most likely to be the correct diagnosis. It was undoubtedly adopted by me as the most warrantable one prior to enucleation. Immediately the clinical result of that procedure was observed the diagnosis seemed greatly corroborated, as it was also by the fact of the large amount of constitutional disturbance manifested during the development of the intra-ocular growth, and the markedly rapid improvement which followed on its removal.

Still postponing the histological report on the specimen, let us glance at the clinical literature of kindred cases. For much of importance respecting ocular tuberculosis I may refer to Mules's* valuable paper.

The very practical question as to what is the correct course to pursue when we have apparently good ground for diagnosing a localised ocular tuberculosis seems to be well indicated by the happy issue in this case; and is suggested by the fact that in the many cases brought before the notice of the Paris Surgical Society, in their discussion on this subject in July, 1879, and especially in eight cases cited by Dr. Anger, death inevitably followed a passive non-interference. At that discussion there was a strong weight of opinion in favour of early operative treatment. This course is advocated by Mules,† who

* 'Ophth. Review,' January, 1885. † Op. cit.

declares enucleation to be imperative, the eye being certainly lost as an organ of vision, and remaining as a standing menace to the health of the individual.

In reference to this treatment by early enucleation Eperon,* after recording a case of irido-cyclitis in a girl aged five years, who made a good recovery after enucleation performed subsequently to perforating hypopyon, says:

"It appears to us then that an early enucleation is the only remedy to oppose to the ocular tuberculosis of children. We must not waste time ordering anti-scrofulous medicines, or laying down even the most rational hygienic rules. This treatment must always be used to combat the morbid disposition of the individual. But before all his pressing danger must be relieved."

The literature of this subject records altogether too few examples of radical operative treatment being carried out early enough to be permanently successful. Thus Swan Burnett's case was operated on too late to afford a good result. It suggests the possibility of a systemic infection along the lymphatics of the conjunctiva in a case of perforating tubercular abscess, and is a striking corroboration of Deutschmann's views as to the method of general infection. However, since Mules's paper, various successful cases have been recorded where enucleation was performed at an early date and with good results. Thus Haab gives one case of which some details are recorded in the 'Ophth. Review,' iv, p. 87. Schäfer (Heidelberg) reports† fully a case of a soldier twenty-two years of age, which has several points in common with my case.

In Schäfer's patient the intra-ocular growth, at first suspected of being syphilitic, increased rapidly under anti-syphilitic treatment, broke down and led to abscesses, which were punctured. When two months had elapsed the eye was enucleated, and the tubercular character of the growth and its origin from the choroid immediately

* 'Archives d'Oph.,' 1883, p. 485.

† 'Klin. Mon. für Augenheilkunde,' p. 307, 1884.

behind the ciliary body were established by microscopic examination.

The disease had spread forward, and involved the ciliary body and iris. The retina was detached from close to the tumour, but free from tubercles.

Bacilli were looked for, but not found. This patient had remained well up to the time of the report.

Neese,* of Kiew, reports upon an eye obtained from Professor Becker, of Heidelberg, which was enucleated for supposed syphilitic irido-cyclitis, resisting and growing worse under specific treatment, and which manifested, on section of the eyeball, a choroidal tumour situated just behind the ciliary region, 8 × 4 mm. in dimensions, having a typical tubercular structure, and containing bacilli. The retina and remainder of the choroid were also infiltrated with a cellular exudation, and showed distinct tubercles. The patient recovered perfectly from this operation, but died later on from gangrene of the leg.

The enucleated eye of my patient was subjected to careful examination by Mr. Albert Carless, to whom I am indebted for the following report thereon :

"The eye, having been well hardened in Müller's fluid, was divided antero-posteriorly in such a way that whilst the mass of the tumour remained in one half, the optic disc and nerve were in the other. The section revealed at once that there was a solid tumour occupying a subretinal position, and that the retina itself was totally detached, except at the optic disc over the tumour and at the ora serrata. This detachment of retina certainly happened at the time of the operation, as immediately before there was no sign of such. The tumour was nearly circular in form, averaging about 9 mm. in diameter. It infiltrates the sclerotic to a slight extent, and causes it to bulge externally ; the maximum thickness of the tumour, measured from the sclerotic, is 4½ mm.

"Sections of the eye for the microscope were made, both through the mass of the tumour and longitudinally

* Knapp's 'Archives,' 1887, p. 434.

through the optic nerve, the half eyes having previously been embedded in celloidin, so as to retain the retina *in situ*.

"Some of the sections were stained histologically by means of Ehrlich's logwood, with magenta as a counter-stain, whilst others were stained by Neelsen's method for the bacillus tuberculosis, *i. e.* the sections were placed for twenty minutes or more in warmed Neelsen's alcoholic solution of fuchsin, decolourised in 25 per cent. sulphuric acid, and then, after washing, counter-stained in aniline blue.

"The result of the microscopic examination proved that the anterior segment of the eye was quite normal, except the detachment of the retina; that the optic nerve was itself absolutely healthy, as also the optic disc, showing that the process had not descended to the eye by that channel, and that the growth was of a fibro-cellular character, with degenerate caseating nodules centrally, whilst peripherally there were many small nodules, exactly similar in structure to miliary tubercles, that is to say, consisting of a central, multinucleated giant-cell, surrounded by and sending out processes amongst a layer of nucleated epithelioid cells, and these again surrounded by layers of ordinary lymphoid cells or leucocytes, which gradually pass into the fibro-cellular stroma of the tumour. Similar nodules, though mostly smaller in size, were found in the retina surrounding the tumour, occupying the nerve-fibre and ganglionic layers; there was also considerable cellular infiltration of the retina near the tumour. No bacilli were found, though carefully looked for by Prof. Crookshank and others."

Ought we to modify our diagnosis of local choroidal tuberculosis out of deference to the absence of conclusive proof from the histological examination? It is now acknowledged that wherever tubercular processes occur, there the tubercular bacillus, if properly examined for, should be found. Nevertheless, one feels little hesitation in maintaining that this is a tubercular growth, and for several reasons. The presence of the *Bacillus tuberculosis* in the eye at all was for a long time doubted; and

although several observers (Lawford, Haab,* &c.) have now succeeded in demonstrating its existence in tubercular lesions, yet they are not always successful, and many cases have occurred which, in pre-bacillary days, would undoubtedly have been called tubercle, and which it is impossible now to remove from that group, although the bacilli have not been found. In some cases the after-clinical history has been such that no doubt could exist of the character of the growth. Thus, in a case of Swan Burnett's† with an intra-ocular growth similar in histological character to the above, for which enucleation was performed, and in which bacilli were not examined for, the patient exhibited, a few weeks after the operation, enlarged lymphatic glands in front of the ear and under the angle of the jaw of the same side. These suppurated in a characteristically tubercular manner, and death from pulmonary phthisis ensued twelve months later.

Moreover, in several recorded cases (*e. g.* those of Reissmann,‡ Becker,§ &c.) bacilli have been found only after great difficulty, and then but in small numbers, whilst in other cases, reported by Lawford,‖ where secondary intra-ocular tubercular nodules formed in cases of tubercular meningitis, although bacilli were found plentifully in the meninges, yet none could be discovered in the choroidal growths; and hence the fact that bacilli have not been found here does not prove their absence, inasmuch as errors in the manipulative technique may be the cause of the non-success. This failure to discover bacilli emphasises the fact, so strongly maintained by Cohnheim, that the surest and really only absolute test of the tubercular character of a small growth lies in the inoculation of another animal (preferably a guinea-pig or the anterior chamber of a rabbit's eye) and the transmission to it

* 'Klin. Monats. für Augenheilkunde,' 1884, p. 391.

† Knapp's 'Archives,' 1883, p. 315.

‡ Graefe's 'Archives,' 1884, iii, p. 251.

§ Communicated by Neese in Knapp's 'Archives,' 1887, p. 434.

‖ 'Ophth. Review,' iv, p. 248, 343.

of a general tuberculosis. This should be done immediately after enucleation, or at least prior to submersion in Müller's or other preserving fluid.

In Reissmann's case this was done by Professor Leber, some of the caseous material being inserted into a rabbit's eye. For some weeks there was no result, but finally typical tubercular changes manifested themselves. Various similar cases have also been recorded.

(*May 3rd*, 1888.)

Dr. Sharkey.—Mr. McHardy's very interesting case cannot be accepted as one of primary tuberculosis of choroid without a critical perusal of the notes of her illness, which was accompanied by ascites and which preceded the affection of the eyes. Many cases of tubercular peritonitis are obscure and present no characteristic symptoms, and probably most physicians will allow that it is a curable, and not infrequently cured, affection. The proofs of the latter statement are partly clinical, partly pathological. One sees patients suffering with ascites and fever, who are young and of tubercular aspect and family, and who under treatment gradually improve and even finally get well. In other cases the ascites disappears, the abdominal symptoms improve, and possible recovery is anticipated, when the patients are carried off by tubercle of the lung or brain. At the post-mortem examination one finds cheesy tuberculous masses and fairly formed wide-spread adhesions, showing that changes had gone some way towards recovery. Finally we have such cases as the following: A young adult came under my care last summer with the ordinary symptoms of Addison's disease, and shortly died. Post-mortem examination revealed bilateral tubercle of the suprarenals, recent tubercle of lung, and in the abdomen old caseous nodules with firm fibrous adhesions; these tubercles had practically become obsolescent. Now, in Mr. McHardy's case it seems to me very likely that the original ailment was tubercle of peritoneum with ascites, and that the choroidal affection was not primary.

X. DISEASES OF THE OPTIC NERVE.

1. *Hereditary optic atrophy.*

By S. Herbert Habershon, M.D.

(Communicated by E. Nettleship.)

The influence of heredity, or a congenital predisposition, has long been recognised as an important factor in the history and etiology of several diseases of the eye, but it is only within the last few years that the term hereditary optic atrophy has found a place in the literature of ophthalmic science.

Leber, who has written several excellent articles on the connection between heredity and eye diseases, accounts for the absence of any description of this complaint from the text-books, and with one or two exceptions from general literature, by the rarity of the affection.

Under the term hereditary amblyopia, or amaurosis, several instances are recorded among writers in the first half of the century of defective sight commencing at a special period of life, and occurring successively in several members of a family or in individuals of two or more generations.

In a paper by Leber (in the 'Archiv für Ophthalm.,' vol. xvii, 1871) upon this subject, the early literature is given, and many of the cases collected together. I cannot do more than refer to one or two of the most interesting of them.

One of the oldest is mentioned by Beer in 1817. Several members of a family in successive generations

became blind. In the third generation it was especially remarkable that several female members became amaurotic at the climacteric period, while of the male members of the family as well as the females it was only those who had dark eyes and dark hair who were affected.

In a case of Travers in 1821 (see Leber's paper, 1871) the three dark-eyed members of a family became at the age of puberty both blind and epileptic. There are several other instances in which two or more members of a family, brothers and sisters, or mother and daughter, are reported to have become amaurotic at a certain age, usually that of puberty, though some were exceptions.

An interesting case is mentioned by Sedgwick in a communication to the Harveian Society 1862, in the 'Med. Times and Gazette,' of a gentleman who became amaurotic at the age of sixty, and of his family four of the sons were affected at the ages of fifty-six, forty-six, forty-six, and forty-two, with an earlier development in each succeeding member of the family. The daughters were all exempt. One of the sons so affected afterwards developed symptoms of paralysis.

It is probable that many of these cases come under the same category as those included by Leber under the name of hereditary optic neuritis, and by some others as hereditary optic atrophy. But the observations, though of great interest, are not sufficiently exact to be of much value, for many of them occurred before the discovery of the ophthalmoscope, and in the later ones there is unfortunately no record of ophthalmoscopic appearances.

Leber founds his description of hereditary optic neuritis upon fifteen cases of his own occurring in four families, and upon three reported by v. Graefe from a single family. In addition to this, in a later article by him in 1877 (Graefe u. Sämisch, 'Handbuch,' p. 824), he adds other cases reported by Mooren, one of Hutchinson's, and some others by Prouff and Alexander, amounting in all to fifty-five individual cases from sixteen families.

According to Leber the disease commences as a rule a

few years after puberty, between the eighteenth and twenty-third year, though it has been observed as early as five years of age, and up to the age of forty-three. Frequently the only trace of a congenital predisposition is that it occurs in several brothers and sisters. Sometimes, however, it is the uncles and aunts of the patient, or cousins of two or more branches of the family, who are affected. In no case was the father attacked, and the mother had suffered in only two of the cases (Hutchinson and Prouff), and in both of these the time of the onset was an unusual one. The disease appears almost exclusively in the male members of the family, though it is frequently transmitted through the female line, and even children of the same mother by different fathers are affected. In all Leber finds the frequency of the occurrence in women amounting to 10 per cent.

In one case of Mooren's consanguinity of the great-grandparents was traced, but in general no history of blood-relationship in the parents or ancestors was discovered.

Leber describes the class of individuals attacked as belonging to the neuropathic type of Griesinger. That is to say, that in many of the cases there is a general disposition to pathological disturbance of the nervous system (such as headache, vertigo, tremors, numbness of limbs, or even epileptiform attacks); but he distinctly excludes all cases arising from organic cerebral disease and meningitis. In all his cases both eyes were affected, but usually at a short interval of time, never more than six months, and to a different degree.

The onset is usually sudden, and consists of a progressive dimness of vision, becoming more intense in the course of a few days or weeks, until the patient is no longer able to decipher even large print, or only with difficulty. For the next few months a more gradual deterioration follows. There are seldom any symptoms of importance In some cases headache is complained of, but it is seldom severe.

Occasionally there are subjective light and colour phenomena, coloured points, clouds, or flashes of light being seen. The loss of vision is for the most part a central amblyopia, usually in the form of a more or less complete central scotoma, though at the commencement this is not always present.

Colour sense is always abolished or much diminished. As a rule the patients see as well in bright daylight as on a dull day or at dusk.

Ophthalmoscopic appearances exhibit but slight changes at the beginning. Usually there is some haziness of the margin and hyperæmia. The vessels are normal in size or even enlarged, and the smaller retinal vessels are sometimes visible. Frequently there are white lines in the course of the vessels, and occasional spots and streaks of exudation accompanying or overlying them. More rarely the condition is normal. These inflammatory appearances give way to a pallor of the optic disc commencing in the outer half and spreading over its whole surface. There are usually moderate changes in the retinal vessels. Meanwhile the disturbance of vision reaches its height coincidently with the alteration in appearance and comes to a standstill, or the sight may even improve somewhat. Leber believes that this pallor is the expression of a true atrophy of the optic nerve due to an increase of its connective-tissue elements, even if the remains of the earlier inflammation are slight or doubtful. In spite of all treatment the central sight is in most cases never re-established, but the periphery of the field of vision is usually retained, and concentric contraction is rare.

In three cases belonging to the same family recovery is said to have taken place, and Mooren claims to have successfully treated one case.

Such is a *résumé* of Leber's remarks upon hereditary optic neuritis.

Since this article there have been several additions to the literature of the subject.

Prof. Fuchs, in the 'Klin. Monats-Blatt f. Augenheilk.' for 1879 (p. 332), reports the cases of three families containing thirteen individuals affected with amaurosis. In the majority of them he had unfortunately to depend on the statements of relatives, but in those observed by him the affection began with the signs of optic neuritis, and was followed by atrophy of the optic disc. All the female members of the family escaped, though one of them transmitted it to her children. The age at which the attack commenced varied between the twenty-first and fifty-seventh year. Treatment was of no avail.

In the 'Med. Times and Gaz.' for 1880 Mr. Higgens reports two cases of atrophy of the optic nerve occurring about puberty. The patients were brothers, aged fifteen and sixteen respectively at the time of the attack. In the former the loss of vision began in the left eye and was followed in three weeks' time by failure in the right. When under observation at Guy's Hospital a few days later both optic discs appeared blurred, especially at their inner margins, and congested. There was also intense retinal hyperæmia. Two months later the outer halves of both optic discs were pale, especially in the left eye. One month later still the pallor had increased, and central vision was now abolished though the periphery of the field remained normal.

In the second case, aged sixteen, the early stages showed the same extreme hyperæmia of the retina and disc, which was followed in the same way by optic atrophy. One other brother was said to have had bad sight.

In the following year, 1881, in the 'Lancet,' ii, p. 869, three other cases are reported by Mr. Higgens, also in members of the same family. Two were boys aged fifteen and ten, one a girl aged thirteen. The sight had failed gradually in each case, and the optic discs presented well-marked signs of atrophy. The mother of these patients had, however, suffered from a cutaneous eruption and sore-throats since the birth of the eldest child affected, and she had several miscarriages previous to the birth of the

second living child, the girl now aged thirteen. It is therefore at least doubtful whether the hereditary taint in these cases was not that of syphilis.

Holz, according to Story, gives an account of atrophy of the optic nerve, occurring in three members of a family, a brother (age unknown) and two sisters aged twenty-two and fifteen and three quarters. In all the symptoms were diminished acuteness of vision and of colour perception. There was also limitation of the fields of vision, especially in the vertical direction.

A paper on this disease is given by Story in the 'Transactions of the Academy of Medicine in Ireland' for 1884, together with some cases of his own. He describes a family of eight, in which five, four brothers and a sister, were affected. Two only of the five were examined.

In the case of the sister the disease commenced six months after the menopause with violent pain in the right eye and failure of sight; in the left eye dimness but no pain.

In the right eye the optic disc was white, with very small arteries and dark, tortuous veins. In the left eye, hazy and with cloudy margins, the vessels as in the right eye, and a small hæmorrhage to the lower and outer side of the disc.

In both eyes there was a large central scotoma absolute for colours and relative for white.

The second patient lost his sight at the age of thirty after a fit in which he was unconscious. He appeared deficient in intelligence and had been twice in an asylum. In his case there was also white atrophy of both discs and central scotomata.

Of the other cases not examined, one brother had suffered from sunstroke in India, and subsequently died of epilepsy at the age of twenty-three (age at which he was attacked not mentioned).

A second brother lost his sight at twenty-one, was excitable and addicted to drink, and was said to have

died of a decline. The third brother died in a lunatic asylum.

The last reference I have to give to any published account of hereditary optic atrophy is that of Norris in the 'Transactions of the American Ophthalmic Society of Boston' for 1880—1884. In his paper in 1881 Norris published at great length the cases of two patients, aged respectively forty-nine and fifty years. The former had been losing his sight for one year and could see very imperfectly. Central vision was abolished in both eyes, and both discs were atrophic looking. The man had never been addicted to the use of alcohol or tobacco.

The second patient was a first cousin of the former on the mother's side, aged fifty, affected in much the same manner. He also had a large central scotoma in each field of vision, but more irregular than in the other case, while the optic discs presented the same characters of atrophy. Both patients were otherwise in good health, and in both the patella tendon-reflexes were examined and found normal. Both patients were improved by strychnia treatment.

The family history is a most interesting one. Five generations were in all affected in a direct line, beginning with the maternal great-great-grandfather, next the great-grandfather, then the grandmother and her three children, the uncle and the mother of the two patients. In each of these three families individuals were attacked, namely, the two patients, a brother of one of them and another cousin (sex and age not given). The disease was therefore, in two cases, conveyed through the female line, and the females were affected, though not so frequently as the males, for six males and three females were the subjects of the disease. In this family there was no history of consanguineous marriages to be traced.

In a second family examined by Norris and reported in a paper of his in 1884, no less than fifteen members in four generations were affected, presumably with optic atrophy.

The family consisted of seven children, aged respec-

tively at the time of the attack 14, 19, 18, 14, 8, 8½ and 7 years. Four of these were boys and three girls. The loss of sight came on gradually in all but one child, whose sight failed in one week.

The prominent symptoms in all the cases were frontal headache with gradual loss of central vision. In two cases exertion produced greater dimness, and in a third impressions of red and blue stars on a field of varying colour were seen. The fields of vision for yellow, blue, and red were contracted in the order given, the central scotoma was usually of an irregularly vertical, oval shape, and extended from five to ten degrees from the fixation point. Without giving in detail the ophthalmoscopic appearances in each of these cases, it may be said that Norris divides them into three stages :

1. The earliest, the stage of cloudy and œdematous swelling with a congested and hazy disc.

2. The shape of grey discolouration, with less haze and swelling, and with bright light reflexes—silvery and yellowish-white lines accompanying, and in some cases overlying, the retinal vessels.

These he considers due to thickening and clouding of the walls of capillary vessels of the retina.

3. In the third stages the reflexes are less marked, the vessels diminished in calibre, and the nerve tissue of an opaque grey colour—in a state of pronounced atrophy.

Two of these patients improved, one before she came under observation, the second after treatment with strychnia.

In this family also there is a long list of relatives affected. The mother and father had good sight and their eyes were examined and found to be normal. Two cousins of the patients were attacked at the age of eighteen and fourteen years, children of their mother's sister (the latter also amblyopic). Two uncles at nineteen years and fifteen years, and one aunt, before mentioned, at the age of thirty-five years. The maternal grandmother had good sight, but it had failed in one of her brothers when he was

fourteen years old, and in her mother, that is, in the granduncle and the great-grandmother of the patients.

In all nine males and seven females were the subjects of this affection, the average age for males being $14\frac{2}{3}$ years, for females $20\frac{3}{5}$ (one aunt, however, being thirty-five years of age). Careful inquiries were made as to consanguinity of parents, grandparents, and great-grandparents, but in each case this was denied.

Lastly, De Keersmaecker, in the 'Recueil d'Ophtalm.' (S. 19) for 1885, reports five cases of so-called axial atrophy of the optic nerve in members of one family, a young man, aged 19, and his four uncles at the ages of 20, 40, 32, and 37 years. The nephew's father was an epileptic, but had good sight. In several of the cases there was violent headache at the onset, followed by the failure of sight.

Central scotomata and contracted colour fields were present. In the youth, while under observation, the optic discs presented the changes from optic neuritis to atrophy, while in the other, who had been attacked many years before, the appearances were of advanced optic atrophy.

I have now to add several cases to those already published, and for all but two of these I am indebted to the kindness of Mr. Nettleship for permission to make use of them, and I may here say for many practical and helpful suggestions in the present paper.

Case 1.—*Amblyopia in two brothers* (*smokers*). (M. 2.)

James N—, æt. 26, applied to me at the General Marylebone Dispensary. He had suffered from imperfect sight since the age of seventeen. Between eight and nine years ago, he says that his eye became inflamed and red, and the sight dim. It commenced, as he thinks, suddenly, and he was admitted at once to St. George's Hospital. He can remember being cupped on both temples, and a few days later injected hypodermically with some drug

that made him sweat (pilocarpin). The recorded ophthalmological appearances were those of optic neuritis. He left in nine weeks without improvement to his sight. Since then he has not become worse, but cannot distinguish people across the street, nor can he read more than the largest letters of print. He has been a great smoker, to the extent of ¼ lb. of Cavendish per week, but has not smoked since his sight failed.

Previous to this he was also a heavy drinker (of spirits). He has taken stimulants occasionally since, but for the last two years has been a teetotaller. There is no history of acquired syphilis, nor of any previous illness. Inquiry has been made as to fits, sexual excesses, discharge from ears or nose, with a negative result.

Family history.—His father died from cancer of the tongue, his mother from phthisis. Both had good sight. Of several brothers all are in good health, and with one exception (case reported next), have good eyesight. I have examined one of these, a telegraph clerk, who has excellent sight. He smokes very little.

The general health of the patient is excellent. The kidneys are healthy, and the knee-reflexes are present and normal.

His pupils are large, but react normally to light and accommodation.

T. normal in both eyes.

V. = counts fingers at 6 ft., and with both eyes can spell 16 J. badly at about 5 in. from the eyes.

Ref. my. about 8 D. in R. and 6 D. in L.

The appearance of the discs is as follows :

Right optic disc pale all over. Lamina cribrosa exposed at parts in centre. Physiolog. cup very steep at the upper part. Some hazy tissue rather below centre. Vessels numerous and tortuous, more so than in L. Small circular patch of choroiditis at outer part of circumference of fundus looks suspiciously like syphilitic choroiditis.

Left optic disc more pale than in R.; otherwise appear-

ances same. Some filmy tissue partly hiding the lower main vein and artery. Thickening of sheath of artery, but not going to edge of disc. No definite disturbance of edge. Veins rather large. All vessels tortuous.

The comment made upon his examination by Mr. Nettleship at the time is that the appearances point to some degree of previous papillitis, but without much swelling. The discs are much more atrophied than is usual in such cases—very trifling myopic crescents.

There is diminished acuity of vision over the whole field. The periphery is not contracted. The defect is chiefly in the form of an absolute scotoma for white, central but extending chiefly in an irregular oval to the outer side of the field for about 15°.

There is a scotoma for red in both fields, larger in R. than L. eye (tested with red skein of silk). In the outer half of both fields scarlet is called pale reddish yellow. Green is seen imperfectly in both eyes, and best a little below and at fixation point. Blue and yellow fields pretty normal.

Subsequently I have had the patient under private observation, and have used nitrite of amyl inhalations daily for a fortnight with the result that at the end of this time his sight had improved from reading 16 J. (or 4 D. Snellen) badly, he was able to read 1·75 D. and a word or two of 1·5 D. Snellen, corresponding to 12 J. and 10 J., and could now distinguish men and women across the street.

Again, after three weeks' interval without treatment his sight is not quite so good. He can, however, read 14 J. slowly, and after an inhalation of the nitrite can spell 12 J.; but though his reading is not greatly improved he is positive that his sight is better than before the treatment.

The second brother, Michael N—, æt. 31, had no serious illness that he can remember. He has always worked since he was a boy as a bricklayer's labourer. About eight years ago, at the age of twenty-two (he thinks in

the summer of 1879), he was reading the paper one Sunday morning and found his eyes dazzled (as he describes it) and could not see the print distinctly. He had not felt the heat. He continued work for a month or so, and was then out of work for three months; but on again obtaining work his sight became so bad that he went to the General Western Eye Hospital, and in the following year to the Marylebone Western Eye Hospital. His sight improved a little, but has continued in much the same condition since without getting worse. He was a heavy drinker of spirits and beer before his eyes were affected, and he used to smoke ½ oz. of Cavendish tobacco a day. He left off all smoking on obtaining advice, but has now for two or three years resumed it to the amount of 2 oz. a week. He now drinks very little stimulant.

He was married at the age of nineteen, and had two children previous to the attack. They are living and have good sight.

He has never had gout. There is no history of syphilis or of fits.

Condition of eyes.—R. : V. = 0; can read about 19 J. Large scotoma for red in central horizontal part of field Oph.: O. D. very pale, centre hazy, edge nowhere perfectly sharp, substance opaque, vessels a little diminished in size.

L. : V. = 0; reads about 20 J. Scotoma for red in central horizontal field, much more dense than in right. At the centre there is almost an absolute scotoma for white. Oph : O. D. very much the same as R., perhaps paler. Edge more sharp. Large vessels less numerous and larger than in R.

Both eyes are slightly myopic, about 1·5 D. Ps. react to lt. and acc.

General condition of health good. No affection of chest or abdomen. Urine healthy, no albumen or sugar. Patellar tendon-reflexes normal.

For the ophthalmoscopic examination of this and the preceding patient I am indebted to Mr. Nettleship.

Case 2.—*Amblyopia in three brothers* (*smokers*). (Nettleship, P. 4, 215.)

Mr. M. J—, æt. 32, has been accustomed to smoke more than ½ oz. of the strongest and best shag per day. Failure of sight began in December, 1879, and by the following January he was unable to do duty. He then consulted an oculist, who stopped his smoking, and for the three months following he did not touch tobacco, and he believed his sight had improved slightly.

In November, 1880, Mr. Nettleship found the condition of his eyes to be as follows :

V. = about $\frac{12}{30}$ and 14 J. Hm. ·5 D.

Ophth.—R. rather worse than L., and has a large diffuse crescent. The discs are rather pale all over. The defect is quite characteristic, and there is a well-marked colour scotoma.

The special interest is that exactly the same thing has occurred in two brothers, who also smoke largely and of the same tobacco. They also have left off smoking.

Case 3.—*Amblyopia in four brothers* (*three being non-smokers*). (Nettleship, P. 14, 177.)

Mr. —, æt. 44, consulted Mr. Nettleship in June, 1887. He had good sight until the spring of 1859, that is until the age of sixteen, and within six weeks it failed, and reached its present state. Previous to this he had smoked, but was advised to give it up on account of his eyesight. He did not leave it off entirely, however, until a year after his sight became impaired. The patient spontaneously describes the defect as a cloud or mist at the centre of the field, and says he can see well all round. He uses a 1″ lens for writing, and ¾″ for reading, and can read up to 10 J. or 8 J. with nose touching the paper, and he manages to make a fair living by literary and

legal work. Colour vision is defective, especially for red, about which he is uncertain, describing it sometimes as drab or yellowish, sometimes, with doubt, as red. The o. ds. present signs of white atrophy.

His family history is most interesting. He is the eldest of eleven, and has had seven brothers and three sisters. Three of his younger brothers are affected in the same way, and are all living; the ages at which the attack commenced were (beginning with himself) respectively 16, 15, 17, and 12 years. None of them but himself smoked, and they disliked the smell of tobacco. Two now smoke occasionally.

No.	Sex.	Age, if living.	Cause of death.	Age of failure, if affected.	Smoker.
1	M.	44	—	16	*Smoked* until 1 year after attack.
2	F.	—	D., æt. 22, of consumption	Not affected	—
3	M.	—	D., æt. 20, of consumption or bronchitis	—	Was a smoker.
4	M.	39	—	15	*Non-smoker*, disliked smell; now smokes a little occasionally.
5	M.	—	D., æt. 24, of disease of spine	—	Never smoked.
6	F.	34	—	—	—
7	M.	32	—	17	*Non-smoker*, but now smokes a good deal.
8	M.	30	—	—	Smokes a little occasionally
9	M.	27	—	12	*Non-smoker*, but occasionally smokes now.
10	M.	—	D., æt. 17, from consumption	—	Never smoked.
11	F.	24	—	—	—

No other cases have occurred in the family, and no earlier ones. There is no history of consanguinity.

There is said to be no difference between the affected and the non-affected group in respect to complexion, colour of hair, or resemblance to either parent, but the

patient says that all his brothers with amblyopia have grey or blue irides, and the non-affected ones brown. His own irides are dull grey with slight brown at the pupillary border.

Case 4.—*Amblyopia in five members of a family, collateral branches, two cases smokers.* (Nettleship, P. 10, 26.)

Dr. —, æt. 34, consulted Mr. Nettleship September, 1884. The sight of the R. eye began to fail October, 1883, and continued to do so until the following April (1884). That of the L. eye failed some five months later, and by the end of April had reached the same condition as the R. In May the patient was able to read fairly. He was a smoker to the extent of 3 oz. weekly (of Wills's birds-eye) since the age of twenty-one, but had never tried Cavendish or any strong tobaccos. He left off smoking on account of his sight. He had syphilis slightly nine years ago. There is no history of sexual excesses.

Present condition.—R. = 20 J. close. L. = about 16 J. or 18 J. very close.

Ps. act to l., but L. not so freely as R.

Both act to ac.

Ophth.—R. brownish pallor, greater at centre of whole O. D.

L.: Very little pallor, and O. D. hazy at border; vessels normal.

Scotomata: Fields are of full extent.

L.: Absolute scotoma for white at centre about 5°—8° up and out from centre. Large scotoma for red extending further towards inner part.

R. field is of full extent. Exactly symmetrical scotoma as to white and red.

The patellar tendon-reflexes are very marked.

There is a family history of amblyopia in several male relatives. The mother died at the age of thirty-five of phthisis, sight unaffected. She had several brothers and sisters, all of whom died of phthisis. Only one of these

was married, and he left a son, who is living and became amblyopic (age not stated). She had five first cousins on her father's side (all of one family), two males and three females. Both males are amblyopic, one at the age of twenty-one, who was a smoker, but ceased smoking when his eyesight failed, and for two years afterwards. He has a central defect of field.

The other male cousin is living. He became amblyopic at the age of sixty, and has since developed diabetes. All the female first cousins of the patient's mother are healthy. Two are married, and the eldest of them has a son, who became amblyopic at sixteen years.

The following family tree shows this history more plainly:

The patient has since been under observation, and his sight has gradually and slowly deteriorated.

In January, 1885, the L. eye is worse. With both can now barely read 18 J. held closely. Thinks the central defect varies in size at different times.

Ophth.—R. still pale all over, and at centre the lamina cribrosa is exposed. Pallor greatest at centre. Veins n., arteries rather small.

L. less pale than R. Arteries and veins n. Edge of O. D. above and below hazy.

July, 1885.—Rather worse. R. and L. = 18 J. badly. Thinks central defect less sharply defined, *i. e.* rest of field less clear. Likes summer evening light best.

Ophth.—R. same as before. L. paler than before, but edges still hazy.

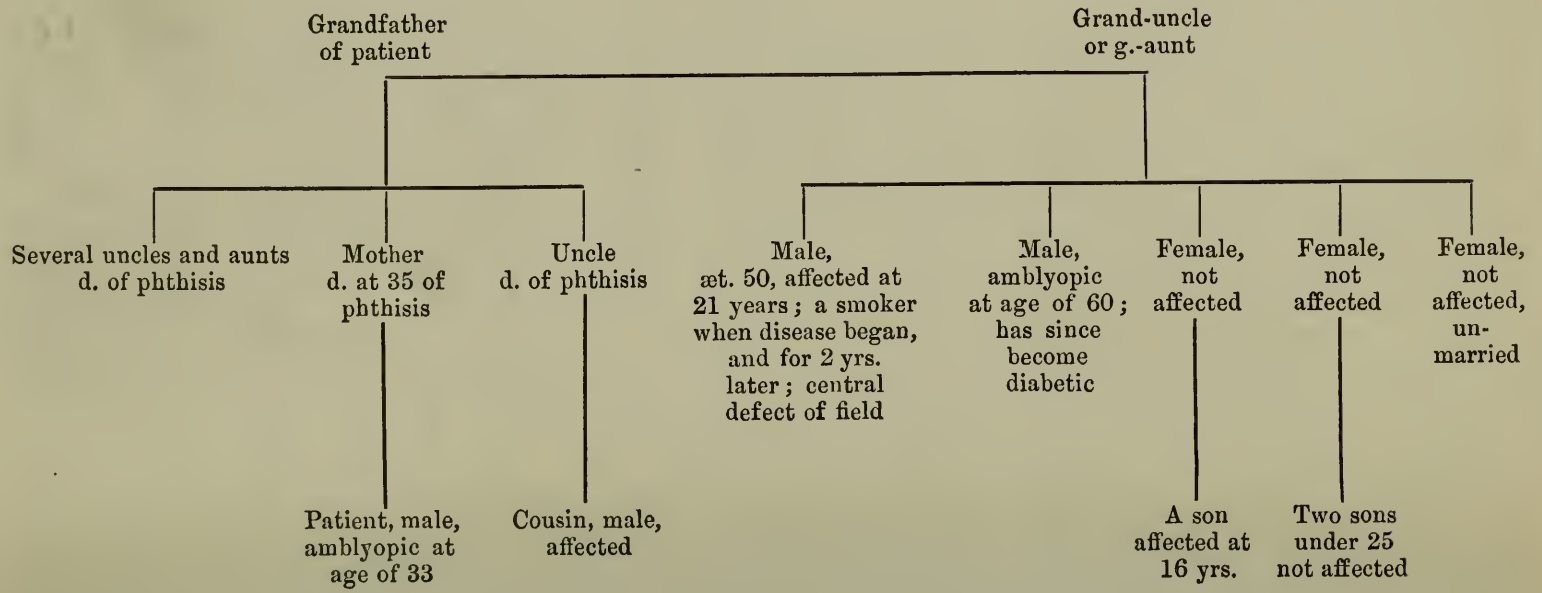
January, 1886.—Still rather worse. On going from bright light into a dark room and suddenly turning the head can see *flashes of fire colour*. Sudden exposure to light causes flow of tears.

L. eye is now the worst, reads 18 J. close. Can hardly see outline of flame anywhere.

Pupil acts to lt. moderately.

Ophth.—O. D. greyer than R., and is now clear. R. about the same. Knee-reflexes still excessive.

CASE 4.—*Family Tree.*


Grandfather of patient
Grand-uncle or g.-aunt
Several uncles and aunts d. of phthisis
Mother d. at 35 of phthisis
Uncle d. of phthisis
Male, æt. 50, affected at 21 years; a smoker when disease began, and for 2 yrs. later; central defect of field
Male, amblyopic at age of 60; has since become diabetic
Female, not affected
Female, not affected
Female, not affected, unmarried
Patient, male, amblyopic at age of 33
Cousin, male, affected
A son affected at 16 yrs.
Two sons under 25 not affected

January, 1887.—Still sees to go about easily, and can see better in lower part of field. Knee-reflexes about normal. Says he can tell colours best in R., but in L. can see red to outside.

Scotoma as before, green not recognised anywhere.

CASE 5.—*Amblyopia in two brothers (smokers)*. (Nettleship, T. O. P., 3, 147; T. I P., 1881.)

J. C—, æt. 20 (January, 1879).

For six months before vision failed he had almost constant frontal headaches and occasional faint feelings in evening. He was so sleepy at dinner time that he had to give up his place in consequence. He improved in health, but shortly afterwards his sight began to fail, and reached its worst in about a month, and for the last five months has remained the same. For three years he has smoked ½ oz. of shag daily until four months ago, when he stopped it altogether. Never excess of sexual indulgence or masturbation, but confesses to occasional indulgence in both. He has a brother whose sight is affected in a similar way.

The patient sees best in evening or in dull light. He recognises large patches of bright colours quite well, but cannot anywhere detect the colour of a 15 mm. square of red. With a piece of 4″ by 1½″ he exhibits a large central scotoma for red.

V. = $\frac{4}{200}$ or so and nearly 20 J. close. Ps. n.

Ophth.—He has decided pallor of Y. S. side of each O. D. The rest is probably too red and œdematous.

Edge on Y. S. side much more sharply defined than the rest. Considerable striation of retina around O. D., and white lines along vessels, especially L.

Veins decidedly enlarged, especially at some distance from O. D. Both the large and small ones are tortuous.

The time of the above examination was about seven months after the sight commenced to fail. He was then nineteen and a half years of age.

He has not smoked for four months.

Patient was an in-patient at St. Thomas's Hospital in 1881, and again in 1883. His vision at the latter date had not improved. He could see $\frac{20}{200}$ barely, and could read 16 J. with the R. and 14 J. with the L. eye. Pupils rather large. The optic discs are grey, pale, and excavated on the Y. S. side, the pale part passing gradually into the healthy part. In both the pallor is accompanied by wasting, as shown by the corresponding part of the physiological pit being exposed, and in it this is very well shown by the zone of nerve substance being distinctly narrower there, though the cup is of the type which is usually central.

Patient still smokes, but is a teetotaller.

Fields are of full size, red is seen duller in R. eye to inner side of fixation point, and in both eyes much enlargement of blind spot. Otherwise no central scotoma.

In 1885 he was again under observation, and his vision was found to be just as before.

His brother has had bad sight now for many years. He has children who are believed to be all right.

The second brother, James C— (T. O. P., 3, 147, Nettleship), draper, came to Mr. Nettleship in January, 1881. There is very little history, except that he was a smoker, and for some time previous (he was then twenty-two) his sight had been failing.

On January 31st, 1881, the note is—

V. $\begin{cases} \text{R.} = 16 \text{ J.} + \frac{10}{100}. \\ \text{L.} = 19 \text{ J. and less than } \frac{5}{200}. \end{cases}$

Ps. react to lt. and accommodation, but are rather large (dull day).

L. is rather larger than R.

Ophth.—There is streaky haze of each retina near O. D. Y. S. side of O. D. is paler than rest. No other changes.

In March is no better.

In April, 1881, thinks he is improving.

V. { R. = some words of 14 J.
L. = some words of 16 J.

His fields were taken with test objects 15 mm. square. There was a central scotoma for red. Green and yellow were not recognised anywhere.

Case 6.—*Amblyopia in two brothers, smokers.* (*History of smoking and sexual exhaustion combined in one.*) (Nettleship, M. I.)

F. V—, a lad æt. 19, under the care of Mr. Nettleship at Moorfields, October, 1884, applied for failure of sight which dated from the previous June (a period of four months). His history was that in January, 1884, he was thrown out of a cart, and his left eye was closed for a week by swelling. The sight, however, remained perfectly good until the end of the following May, when it gradually failed in both eyes, at first for distant objects. It has now become so bad that he is unable to read or write, or to distinguish colours. For the last two years he confessed to great sexual excesses. In fact he makes no secret of the fact that he has led a loose life, and volunteers the statement that he is much subject to nocturnal emissions. There is no history of syphilis. He has never suffered from a rash or sore-throat.

He is a moderate drinker, and never takes spirits. Two years ago he began to smoke, and for the last six months has smoked cigars freely, two or three each evening, and five or six on Sunday, but not more.

His family history is important, inasmuch as one brother suffers from amaurosis and probably a sister. His brother, now aged thirty, was a soldier in India, and at the age of twenty-three his eyesight failed (both eyes together). It was said to be due to the effects of the sun. He had been twelve months in India, and he was invalided in consequence of his bad sight. During this time he had smoked a good deal, but did not leave it off.

His sight improved a little, but is now as bad as that

of the patient, and he cannot see to read or write properly. A sister of the patient has bad sight, and has to wear glasses. She is always ailing, and was subject before her marriage ten years ago to (? epileptic) fits. Two other sisters and a brother had good sight. The brother died of consumption.

The patient's father had good sight. He died of consumption. The mother is living, and has worn glasses for many years.

The condition of the patient's eye is as follows :

The pupils are equal and react briskly to light and acc.

Ophth.—Retina hazy, with lines along the veins. Arteries rather diminished in size.

Vision : Fingers at 12″ both eyes, 20 J. barely. The fields are not limited peripherally.

In both eyes there is a complete scotoma for white, oval in shape, and extending to about 12° to the outer and 5° to the inner side of the fixation point. Also a scotoma for red of larger dimensions and of about the same shape, 20° in the outer direction and 10° in all other directions from the fixation point.

I examined and took the case of this patient myself, and found him otherwise healthy. The knee-reflexes present and normal, and the urine normal.

The patient left the hospital unimproved. He was treated by galvanism and the internal administration of strychnia.

Case 7.—*Amblyopia in brother and sister (no cause assigned).* (Nettleship, M. I.)

Margaret L—, æt. 41. In-patient at Moorfields, under the care of Mr. Nettleship, January, 1887. Her history is of increasing weakness of vision in both eyes for four or five weeks, the sight better at night, and the failure increasing gradually up to the present time. About six months previously she was much subject to great irritability and depression of spirits, crying if left alone, and

feeling, as she expressed it, "as if everyone was against her." No cause was assigned except the worry of a large family. She had been married eighteen years, and had had eight children and one miscarriage, two years ago. She nursed all her children for seventeen months except the youngest, a baby eleven months old, whom she weaned a fortnight after the eyesight began to fail. At the time of the commencement of the attack she was frequently giddy, and once or twice sick, but never suffered from more than slight headache. There was no history of diplopia or fits, nor of syphilis or any constitutional disease. One brother had defective sight from the age of twenty-three to the time of his death at the age of forty (from some chest complaint). His disease was called "weakness of the nerves of sight." He was a gardener, and could not tell one flower from another by its colour. He did not smoke.

All other members of the family have had good sight, nor is there any affection of the eyesight in cousins or near relatives. There is also no known family history of neuroses.

The patient is in good health. There is no anæmia and no appearance of spinal trouble. The knee-reflexes are normal and well marked. The pupils react to light and acc.

V. { R. eye = $\frac{6}{0}$, and reads some letters of 20 J.
{ L. eye = $\frac{6}{0}$, and reads some words of 19 J.

There is slight mixed astigmatism.

Ophth.—R. O. D. decidedly hazy and paler than L. Arterial sheaths are thickened.

L. some diffuse haze of retina, but very slight change in O. D.

Fields: On commencing to take the field, the patient could see the central white spot, but at the close of examination was unable to do so.

There is an absolute scotoma for red in the centre of field extending to 15° from fixation point (red spots two inches square). She calls red mahogany colour at the

periphery. Green at the periphery appeared as white. An absolute scotoma for green not so large as for red.

At the end of March the note is :

Sight a little worse, health good. Appearance of R. O. D. much as before. In L. eye pallor of O. D. has much increased. With R. eye counts fingers at about one foot, and reads less than 20 J. In L. V. = letters of 19 J.

After inhalation of nitrite of amyl, the colour of o. ds. is distinctly improved, and V. = letters of 16 J. in L. Same in R. as before.

The colour sense is very defective ; with L. mixes up pale shades of green and brown ; with R. mixes green and red.

In April the inhalations have no effect. Vision remains unaltered. R. = letters of 20 J., L. = letters of 16 J.

These cases present a picture of the disease similar in most respects to the careful description of Leber,—a disease commencing in a large proportion of the cases at or shortly after the age of puberty, in some others at a later period of life, producing little or no disturbance of health, accompanied in many cases by headache more or less severe, and occasionally by subjective phenomena.

The alteration of sight is, in all but a few cases, gradual in its onset. The diminution commences from the first as a central amblyopia with the formation of a scotoma, sometimes complete, more often complete for colours and relative for white. The peripheral vision is generally undisturbed, though there may be partial contraction of the colour fields.

Sight is never completely abolished, but when the disease comes to a standstill, which occurs in the course of some months, as a rule, it is seldom that more than a slight improvement takes place. The changes in the optic nerve consist of a partial neuritis or papillitis, not of an intense character, but proceeding in all cases to atrophic changes in the disc.

Such are the distinctive features of the disease. The

number of individuals in the cases I have quoted (exclusive of Leber's 55 cases) is 75. Of these, 62 occur in males, and 13 in females. The age at which the disease commenced is mentioned in 51 of these cases only.

In order to make my statistics more complete, I add to these 51 cases 14 of Leber's cases in which I find the ages recorded.

The age of onset in these 65 will be seen more graphically in the accompanying Table. (See p. 216.)

In males, with the exception of six at or below the age of thirteen, the majority are of the age of puberty or thereabouts, for 39 are between 14 and 23 years inclusive (with an average of $17\frac{3}{4}$ years). In adult males seven cases occur between 30 and 40, and three between 40 and 50, while one occurs as late as 60.

In females also the disease begins for the most part at puberty. One case only is recorded as early as $8\frac{1}{2}$ years, while seven cases are between 13 and 22. The remainder (with two exceptions, of Leber's at 27 years) are at a later period of life, five cases from 35 to 48 years of age.

It is worthy of notice then that in both sexes the cases are more or less roughly grouped about two periods of life, that of puberty or thereabouts in the majority, and in a smaller number at an age of which forty is the average.

The above seventy-five cases represent seventeen families. Of these only five are strictly hereditary, the remainder occurring for the most part in brothers and sisters (*i. e.* collateral cases).

The five are as follows:

In one of Fuchs's three families, two brothers and the five sons of their sister, who was healthy, were affected; the relationship was therefore between uncles and nephews.

In Keersmaecker's cases it was that of four uncles, and their nephew whose father was healthy.

In Nettleship's case (4) the family tree shows the disease in two collateral lines,—the first represented by two first cousins of the patient's mother, the second

Cases referred to.	Sex.	Age at time of attack.	Rapidity of failure.	Habits.	Cessation of smoking after onset.	Hereditary tendency or previous illness.	Remarks.
Fuchs's cases. 13 members	All males	21 to 57	—	No history	—	—	13 members in 3 families. One female transmitted it to children. (3 sons.) (2 sons with 5 sons of healthy daughter.) (3 sons.)
Higgens. 2 brothers	M.	15	2 or 3 months. L. 3 weeks in advance of R.	—	—	—	—
	M.	16	—	—	—	—	—
Higgens. 2 brothers and 1 sister	M.	15	Gradual	—	—	—	Mother probably contracted syphilis after birth of eldest son.
	M.	10					
	F.	13					
Holz. 1 brother and 2 sisters	M.	?	—	—	—	—	—
	F.	22					
	F.	$15\frac{3}{4}$					
Story. 5 cases in one family	M.	30	—	—	—	Fit preceded attack	—
	M.	21	—	Drunkard	—	Excitable; died in lunatic asylum	—
	M.	Before 23	—	—	—	Epileptic	—
	M.	—	—	—	—	Lunatic	—
	F.	Soon after menopause, call it 45	—	—	—	—	—
Norris. 2 patients, 1st cousins.	M.	49	—	No drink or tobacco	—	—	—
	M.	50	—	—	—	—	—
(10 cases in all)	5 M. 3 F.	Ages unknown	—	—	—	—	Five generations affected.

Norris.	M.	14					
7 children in one family	M.	19	Gradually in all but one, whose V. failed in one week	—	—	—	14 members in 4 generations.
	F.	18					
	F.	14					
	M	8					
	F.	8½					
	M.	7					
2 cousins	M.	18	—				
	M.	14	—				
2 uncles	M.	19	—				
	M.	15	—				
1 aunt	F.	35	—				
Great-uncle	M.	14	—				
Grandmother	F.	—	—				
Keers-maecker.	M.	19	—	No history	—	Father of patient not affected, but an epileptic	Violent headache in patients at time of onset.
5 cases.	M.	20					
4 uncles of patient	M.	40					
	M.	32					
	M.	37					
Nettleship's cases.			Both eyes together.				
Case I.	M.	17½	In 9 weeks	Heavy smokers and drinkers	Ceased	? Syphilis in one	—
2 brothers	M.	22	In 3 or 4 mos.		,,		
Case II.	M.	31	In 1 month	Smoker	Ceased at time of attack	—	—
3 brothers	M.	—	—	,,	No history	—	—
	M.	—	—	,,	,,	—	—
Case III.	M.	16	6 weeks	Smoker	Partially ceased at time, stopped in 1 year	—	—
4 brothers	M.	15	No history	Non-smoker	—	—	—
	M.	17	,,	,,	—	—	—
	M.	12	,,	,,	—	—	—

Cases referred to.	Sex.	Age at time of attack.	Rapidity of failure.	Habits.	Cessation of smoking after onset.	Hereditary tendency or previous illness.	Remarks.
	M.	33	R. in 5½ mos., L. in 5 weeks, and began 5 mos. later	Smoker	Ceased at time	Syph. slightly	—
Case IV. 5 cases	M.	21	—	,,	—	—	Cases in collateral branches.
	M.	60	—	—	—	Diabetes later	2 first cousins of mother of patient. (Father's side. Child of father, first cousin of mother.)
	M.	—	—	—	—	—	
	M.	16	—	—	—	—	First cousin of patient on mother's side.
Case V. 2 brothers	M.	19	1 month, both together	Smoker	Stopped 3 mos. after affection of sight	—	—
	M.	21 or 22	—	?	—	—	—
Case VI. 2 brothers	M.	18½	Gradually in both, 3 or 4 months	Smoker, and sexual exhaustion	Ceased smoking at once	—	—
	M.	23	Gradually	Smoker	Not at once	Epilepsy in 1 sister	1 sister bad sight; doubtful as to nature.
Case VII. Brother and sister	F.	41	In 4 or 5 weeks	—	—	—	Has a large family. Over-lactation. Nursed all but last for 17 months.
	M.	23	—	Non-smoker	—	—	—

Age of Onset in Sixty-five Cases of Leber's Disease.

	Under 10.	10 to 14.	15 to 19.	20 to 24.	25 to 29.	30 to 34.	35 to 39.	40 to 44.	45 to 49.	50 to 60.
Males ...	7 8	10 12 13 14 13 14 14	15 16 17 18 19 15 16 17 18 19 15 16 18 19 15 16 18¼ 19 16 16	20 21 22 23 20 21 22 23 20 23	28	30 31 32 33	37	40 43	48 49	60
Females	8½	13 14 14	15¾ 18	20 22	27 27		35	41 43	45 48	

containing the patient, his first cousin and a second cousin. In two cases in this family the disease is conveyed through the female line.

In Norris' family of fourteen amblyopic individuals, four generations are involved. In the first the great grandmother, in the second only one of her sons (the granduncle of the patients) is affected, but her daughter, the grandmother, is healthy. Both of these, however, transmit it to the third line, the affected father to his son, and the unaffected mother to sons and daughters. The fourth generation is only represented by the latter branch of the family, but we have examples of an affected as well as an unaffected mother conveying it to sons and daughters. Lastly, in the other family of Norris, five generations are represented. The disease comes in a direct line through an affected great-great-grandfather, great grandfather and grandmother, and thence to sons and daughters, of whom both affected and unaffected transmit it to their children.

The only alteration, then, that I should make in Leber's statement is that the disease may occur in more than three generations, for here are examples of four and five, that mother may convey it to daughter, herself being affected, and that as a rule a generation is not skipped in the transmission, as is the case occasionally in other hereditary diseases.

In seeking for light as to the nature of this affection, two questions at once arise : What other diseases of the optic nervous apparatus bear the stamp of heredity ? And are there any other hereditary diseases in which the optic nerve suffers ?

In answer to the first of these questions, we may say that one disease at least presents some points of resemblance to these cases of optic atrophy.

Retinitis pigmentosa is an affection which, more strongly perhaps than any other, illustrates the influence of heredity on eye diseases. It also develops at an early age.

In Mr. J. Hutchinson's account of this disease (published in the 'Ophthalmic Review,' vol. i, 1882) he remarks that "it is rarely present at birth, it begins in childhood about the age of puberty, is troublesome in adult age, and slowly advances to almost total blindness at the age of forty or fifty, or it may be sooner. It very probably depends upon structural changes similar in nature to those associated with deafmutism, for it is transmitted under the same laws, and the two conditions are often present together in the same individual." Mr. Hutchinson further shows that there is good evidence that the taint of consanguinity is to be traced in a considerable number of the cases.

It is possible that in some of the early examples of hereditary amaurosis reported before the use of the ophthalmoscope, retinitis pigmentosa may have been the condition present. In several important particulars, however, this disease differs from the one under discussion. Retinitis pigmentosa begins at the periphery of the retina. The optic atrophy is secondary, and appears late in the disease, and is more complete than in hereditary optic atrophy. Further, the early and prominent symptom (according to Mr. Hutchinson) is night blindness, or the inability to see well by artificial light, which is speedily associated with the gradual failure of vision. Central vision is not affected from the commencement, as in the disease described by Leber, but at a late period it becomes abolished, and in many cases total blindness results.

I have, however, only been able to find two cases of the hereditary optic atrophy which forms the subject of this paper, where blood-relationship of the ancestors has been recorded. These are a case of Leber's, in which the grandparents are said to have been first cousins, and one of Mooren's, where the grandparents were related. This proportion might occur in a similar number of cases of almost any disease, and there is no evidence that a taint of this description bears any relation to the hereditary

influence present, while in retinitis pigmentosa it is more than probable.

I include under the genus retinitis pigmentosa other cases which are strictly hereditary if not congenital (present at birth), and which have their affinities to the more typical disease. All these cases, however, differ in essential particulars from the disease under discussion, and in this direction, therefore, the result of inquiry is negative.

In answer to my second question, one naturally turns to the cases recorded for examples in the patients or in other members of their families, of constitutional affections.

Hereditary syphilis appears in one case (Higgens, 'Lancet,' 1881, ii, 869). The mother of the three children developed symptoms of syphilis between the birth of the eldest and the second child, so that in the first at least this disease could have had no share in determining the optic atrophy. It is also improbable that the syphilitic taint was responsible for the disease of the younger children, for it must be more than a coincidence that the eldest patient, who was free from all suspicion of syphilis, should be the subject of the same affection of the optic nerve as the two younger children, who were exposed to infection from their mother.

It may be remarked that each child was attacked at an earlier age than the preceding brother or sister.

In Case 1 there is a doubt about hereditary syphilis on account of the presence of a suspicious-looking spot of peripheral choroiditis in one of the eyes of the patient (James N—). There is no history of acquired syphilis. It is difficult, however, to see what part syphilis can play in this disease. It may have had some influence in producing an earlier development of the disease in the younger members of the family of three (Higgens' case), it may be merely as an excitant acting in persons predisposed by their constitution to eye affections; but this is purely hypothesis, and I am more inclined to think that it

has nothing to do with the disease in question in the cases in which it occurs.

Of hereditary affections of the central nervous system, *epilepsy* appears in several of the histories. Leber, in his article in Graefe's 'Archives' for 1871, refers to Travers' interesting case of members of a family who at the age of puberty became blind and epileptic. It is not of course certain, however, that these cases belong to the disease in question, for it was in the pre-ophthalmoscopic period. He mentions also one of his own cases who suffered from attacks of epilepsy, and in one of Graefe's cases the mother of the patient was an epileptic.

In the *résumé* I have given of reported cases there are several examples.

In three of Story's cases is a history of fits or epileptic attacks. One patient lost his sight after a fit in which he became unconscious. Another brother died of epilepsy. A third was of weak intellect, and died in a lunatic asylum.

Finally, in the cases of De Keersmaecker the father of the patient was an epileptic (though his sight was good).

I think there is no doubt that in these cases epilepsy is not the cause of the amaurosis. True epilepsy, as we know, is essentially a disease of the highest brain centres, and is seldom accompanied by any affection of sight. The amaurosis that I believe sometimes occurs at the time of a fit and shortly afterwards, is a temporary suspension of function, and the loss of sight is probably analogous to numbness and anæsthesia in other parts of the body.

I can find no record of any but a temporary failure of sight, which returns at a variable period after the attack. Of epileptiform seizures dependent on a gross cerebral lesion (as distinct from true epilepsy) I do not speak. We have* Dr. Hughlings Jackson's authority for stating

* 'Ophth. Hosp. Rep.,' vol. v. Hughlings Jackson on "Defects of Sight in Diseases of the Nervous System."

that it is only in these cases that optic neuritis or atrophy occur.

The occurrence, then, of epilepsy cannot be regarded as more than an evidence that these families are specially liable to disturbances of the nervous system. Leber has expressed it by describing them as of the neuropathic type, or, as we usually express it, neurotic individuals or persons who are subject to neuroses not dependent on organic disease.

Of *insanity* I have little to say. It will be remembered that in Story's cases two members, if not three, were subsequently insane, and one had been in a lunatic asylum previous to the onset of his eye disease. Here, again, with the exception of general paralysis and cases of cerebral tumour, I cannot discover any record of definite eye-changes in the insane.

In two cases only (Nettleship, M. 1, 129, and T. O. P., 2, 181) can I find the combination of amblyopia and weak intellect or insanity. In both there is also colour blindness but no central defect, and both cases are anomalous in other respects, the visual fields are partially contracted, and by the ophthalmoscope both present more definite neuritic changes than is usual in cases of hereditary atrophy. These cases may be allied to the disease under discussion, but they differ in many essential points.

Of one other class of nervous diseases which has a special connection with affections of the optic nerve I have said nothing. I refer to *diseases of the spinal cord.* They are not represented in the histories of these patients or their families.

Apart from the complete absence of spinal symptoms, one fact, which is now generally recognised, serves to distinguish at the outset the cases I have been describing from spinal cases. This is with regard to the simultaneous onset in the attack. There is almost always an interval, frequently of considerable length (months), between the development of atrophy in the two eyes in most cases of spinal disease, a condition differing greatly from the

simultaneous, or almost simultaneous, onset in Leber's disease.

This fact is true, I believe, for locomotor ataxy and general paralysis, but there are cases of disseminated sclerosis recorded in which the atrophy commenced at the same time in the two eyes. ("Eye Symptoms in Diseases of the Spinal Cord," 'Trans. Oph. Soc.,' vol. iii, p. 254.)

Further, it is rare for a spinal case to exhibit a central scotoma. According to Uhthoff (in his work on 'Optic Atrophy,' Berlin, 1884, 'Ophth. Rev.,' vol. iv) out of forty such cases not one showed signs of commencing scotoma in an early stage. Colour blindness, on the other hand, is common, and peripheral contraction of the fields, with not infrequently defects of sector-shape, is now regarded as a point of much diagnostic value in distinguishing early cases of spinal disease from other forms of optic atrophy. It is only in these early stages that the cases can be doubtful. The progressive nature of the atrophy or the development of special symptoms soon reveals its character.

One spinal disease, which has recently come into notice, is worthy of mention because of its hereditary tendency. I refer to *hereditary ataxia.*

It was first described by Friedreich in 'Virchow's Archiv,' and is the subject of an interesting critical digest by Dr. Ormerod in the April number of 'Brain' for 1884. It is not as a rule transmitted from one generation to another, but usually several members of the same family, brothers and sisters only, are affected. Still, in a few instances, ancestors or near relatives have suffered from ataxia. The individuals or their families appear to be specially prone to other neuroses, and the disease attacks males and females alike, and either in childhood or at an early period of life. It differs from ordinary tabes dorsalis in the absence, in most cases, of all sensory disturbances and of all eye symptoms, except nystagmus, which has been observed in several of the

cases. It does not therefore help us directly in the present investigation.

We are obliged, then, to fall back upon the somewhat vague assertion that the hereditary nature of this affection depends upon the transmission of a diathesis (which is not in itself a morbid condition, but implies a special proneness or tendency to disease), and that this diathesis, whether it manifests itself by functional neuroses, or remains latent at first, may, in response to certain exciting causes, exhibit itself in the local inflammation of which this disease consists. Mr. Hutchinson, whose definition of the term diathesis I have given above, has illustrated this in his work on the 'Pedigree of Disease,' which well repays a study, and I shall have occasion again to refer to some of his views.

We see an analogy in the gouty diathesis. It has been said that a gouty patient is always in a state of unstable equilibrium, "on the balance," so to speak. A very trivial exciting cause, a trifling injury to the foot, the syringing of the ear with warm water, will not rarely determine an attack of acute gouty inflammation to the part in one who is the possessor of such a tendency. One might multiply instances.

It is not necessary then to look further for the cause of a neurotic tendency which, at present, we must be content to know does exist, but rather to seek for the exciting causes which determine the local inflammatory process. Here too we have to be content with the knowledge of certain causes which are prone to affect the optic nerve without being able to discover why this particular part of the central nervous system should be specially selected.

An influence upon the eyesight, and in fact one tending to many nervous disorders, is undoubtedly that of the *sexual system*. Mr. Jonathan Hutchinson has brought this into prominence some years ago in his article (one of a series of lectures) on the sexual system as a cause of eye disease ('Ophth. Hosp. Rep.,' vol. ix, p. 1—15).

"Amaurosis occurs in common with other symptoms of nervous exhaustion from sexual abuse or excesses." In one class of cases (Mr. Hutchinson says) the sight fails at or about puberty, or perhaps a few years later, without apparent cause, and under circumstances which, whilst nothing can be proven, much may be suspected. These cases occur almost solely in males. Sometimes two boys in the same family are attacked. There is no visible neuritis, but the discs become pale.

In women, according to the same authority, the influence of the sexual system is less marked; sexual irregularities are less potent in them than in men. In later life, at about the climacteric period, he believes cases of eye disorder to be more common.

By these quotations I wish to impress the fact that two ages are more or less clearly marked out as being, more than any other, those of susceptibility to nervous influences, namely, that of puberty or thereabouts, and the period of cessation of the sexual functions.

Prof. Cohn (in 'Arch. f. Ophth.,' vol. xi, 4, p. 428) expresses strong opinions on the influence of sexual excesses and abuse upon eye disease. Without, however, taking the extreme view that his opinions represent, there are authentic cases on record where a central amblyopia, very similar in almost every respect to these cases of Leber's disease, has occurred apparently from the above cause alone. As a good example I quote one of two cases published by Dr. Glascott in 'Ophth. Review,' April, 1883 ("Two Cases of Amblyopia arising from Sexual Excess").

J. R—, æt. 18. Sight failed at seventeen, L. before R. very gradually. History of masturbation for eight years previous to attack. No syphilis, hereditary or acquired. Patient is an abstainer and smokes very little. *Ophth.*—Pallor of optic discs with stippling. Vision at first, fingers at 6′, six months later 19 J. Fields then taken were of full extent, and with a small central scotoma. Colour sense normal. No improvement in vision one year later.

In the second case, aged twenty-two, the optic atrophy was more complete, the fields of vision irregularly contracted, and no scotoma observed.

In other of these so-called sexual cases there is a definite history of excessive smoking, and it is not possible to determine whether the tobacco poison or the sexual exhaustion has been the most potent depressing influence. The following is a case in point.

Case of amblyopia, ? tobacco, ? sexual exhaustion as incitant. (P. 10, 119, Nettleship.)

Mr. R—, æt. 24, consulted Mr. Nettleship November, 1884. About the middle of April, 1884, the sight of both eyes began to fail, and in one or two weeks he was unable to read. At the time that vision failed he "had an affection of the legs;" he could not go up steps without holding his thighs, and if the knees were bent he was unable to straighten them. This was accompanied by a soreness of shins or legs, but no other pain, also with coldness of the legs. He attributes it to cold after changing to thinner clothes in very cold weather.

The patient is a dissolute young man, has syphilis derived from sexual excesses since age of twenty-one. He smoked before the attack, and for two months after sight failed.

In June, 1884, seen by a doctor, who reported: Vision stationary lately. Is a great smoker. Ps. sluggish, but react to lt. and acc.

With R. eye counts fingers at 9′. Field n.

With L. eye counts fingers at 4′. Atrophy of O. D.

Gait said to be ataxic. No knee-reflexes. No tender spine. No Argyll-Robertson phenomenon. No headache or confusion. No injury or fever. No tenderness of spine. Denies syphilis, though there is a possibility of hereditary syphilis.

In July seen by same doctor. Marked improvement in gait. Sees better at periphery.

Seen by Mr. Nettleship in November, 1884.

V. R. less than 20 J. P. about 6·5, acts less and less briskly.
L. a letter or two of 20 J., close. P. = 5, acts fairly to lt.

Defect of fields greatest at centre, occasionally sees red of a very large square above centre of F. Sees it worst to inner side of centre. Sees colour of blue square of 10 mm. held very close, but not of red, green, or yellow.

Ophth.—Greyish pallor of each O. D., vessels about n. size.

R. veins and arteries all too tortuous. Marked white lines in each, going beyond O. D. Decided haze of upper and lower border of O. D. Appearances suspicious of some papillitis in R.

L. veins not so tortuous, and no haze. White lines as in R.

In neither eye is there any haze or filling-in on O. D. Knee-reflexes are present, but defective in each. Gait is not ataxic now. Patient appears strong and healthy. No sexual failure.

Family history.—Father died at seventy-seven of stricture of urethra (dissolute). Of two uncles of patient on mother's side, one suffers from some eye disease "from syphilis," the other has been deaf from birth.

Both in this and Case 6 it is open to question whether the sexual exhaustion may not have been the depressing influence which determined the attack of tobacco amblyopia, and in these cases, where the twofold condition is present, it is not possible to determine which is paramount.

I cannot therefore insist strongly upon the importance of this group, but I regard the frequency of Leber's disease at the two most sensitive ages as at least highly suggestive.

This brings me to a cause of amblyopia which is almost of daily occurrence, namely, the toxic effects of *tobacco*.

One is struck with the remarkable similarity between the hereditary cases which have been described and those of the so-called tobacco amblyopia. These are too well known to need description. I shall merely mention a few points for the purpose of comparison.

Tobacco cases occur among males chiefly in early or middle adult life, and commonly among those who smoke the stronger kinds of tobacco (Cavendish and shag). The onset is usually gradual, but is more rarely described as sudden. Both eyes are affected simultaneously with a general failure of acuity of vision, and there is a central defect exhibiting a scotoma for red and green, with or without an absolute scotoma for white (usually of smaller extent). There is seldom contraction of the periphery of the field, and the colour sense is usually unimpaired at the periphery.

Further, beyond the impairment of vision there are no symptoms of any moment. These are resemblances.

The ophthalmoscope reveals but slight changes in the majority of cases. At an early stage congestion of the optic discs may be observed with haze and perhaps ill-defined margins, while later there is a distinct pallor of the outer half, which may persist, and in fact be the only abnormality observed. These changes may, however, be doubtful or absent. On the other hand, in cases which do not improve, the whole disc may be pale and present the signs of partial atrophy.

Still, it is probable that the different appearances are a matter of degree rather than of kind, and that in all cases the irritation of optic nerve leads to a neuritis, which according to circumstances produces a more or less complete sclerosis of certain of its fibres.

Tobacco cases nearly all get well provided the irritating cause is stopped and the patient ceases to smoke. The prognosis is therefore good in all but long-standing cases, whereas in the disease of Leber there is no retrogression, and in all cases the symptoms progress until the optic nerve is partially atrophied. There are some tobacco

cases, however, which do not improve. They are usually described as bad cases or cases of an aggravated type. Even when tobacco is at once cut off the sight continues to fail up to a certain point, and, as in Leber's cases, it comes to a standstill, and the patient remains with a double central amblyopia and incomplete atrophy of discs. These cases occur usually among juvenile smokers. They are not common, and I shall therefore report two cases, which Mr. Nettleship has kindly allowed me to make use of.

Case of juvenile amblyopia. (Nettleship, T. I. P., 1878, p. 124.)

John H—, æt. 18, boiler maker, was admitted under Mr. Nettleship October, 1878.

Sight very good until one month ago. Failure began with "dazzling" one morning, and has continually got worse. For three weeks he continued work, but was then discharged for "fumbling at his work" as he described it. Has had a little throbbing at the eyes, but no headache.

For several years has smoked shag, about $1\frac{1}{2}$ oz. per week. Had no difficulty in learning to smoke. Has used lead in his employ, but is aware of the danger and always cleans his hands carefully.

V. = $\frac{20}{0}$ and 20 J. at 9″ with each eye.

Pupils active. T. n. Tested with coloured wools he confuses colours. He calls light green and yellow = "yellow." Reds, dark greens and browns = "brown." Magenta, grey, and shades of purple and blue = "grey or blue."

Ophth.—Discs alike, but changes rather greater in R. than L. Slight but definite pallor all over, greater to the y. s. side. Notable haze of all except y. s., not hiding margin entirely but obscuring markedly, and extends some little way into retina. Retinal vessels markedly tortuous, especially veins. Refraction somewhat myopic in both, but at O. D. some of the vessels are definitely

Hy.; thus there is notable swelling. The changes are greater than is usual in tobacco cases.

November 21st.—Patient thinks he is better. Denies sexual excesses and masturbation.

Family history inquired into. He is the fifth of seven children, three males, three females, one female dead. No history of bad sight in any of family.

With + 8 V. = 18 J. at 8″ and just words of 19 J. at about 9′ without glasses.

Ophth. much as before. Pallor of O. D. all over.

In R. decidedly greater on y. s. side; in L. this is not marked, and pallor is altogether less than R.

The patient says that everything looks "blue" before him, that is, of the colour of purple wool which he picks out. Blues and purples are now not confused. With regard to other colours, he is red-green blind. Examined by one of the physicians in December he was found to be otherwise healthy.

On April 14th, 1879, his sight is worse. Pupils still active, not materially dilated. Complains that upper parts of things look gold colour, and lower parts look blue.

He was readmitted to St. Thomas's Hospital unimproved, on April 21st. He now complains that the blue colour has turned to red.

Case of juvenile tobacco amblyopia. (M. I., 191, Nettleship.)

W. B—, æt. 21, carpenter, December 31st, 1884, complains of increasing failure of both eyes gradual for three months. No other symptoms.

Has smoked for eighteen months about 1 oz. of birds-eye tobacco per week. Cannot smoke anything stronger. Has never found his sight worse after smoking. Drinks beer, but less than one pint a day. No history of

syphilis or of any sexual excess. No family history of blindness or failure of sight. Sight is better in the evening.

V. is less than $\frac{6}{60}$ both eyes.

R. H. = 3 D. Ophth. O. D. pale, hazy, somewhat swollen, vessels bending at upper border, marked white lines about the centre of O. D. Right eye diverges a little.

L. O. D. less altered than R. H. = only 1 D.

Appears to have central scotomata for white (brief trial). Has a scotoma for red specially to outer side of fixation point.

Three months later, in March 21st, 1885, he was again examined.

V. now = $\frac{2}{60}$ for R. and L., and 19 J. badly.

Ophth.—R. O. D. hazy at upper and inner part, whole disc pale, especially at its outer part. Still the same bending forward of upper vessels, making difference of 3 D. at upper margin of O. D.

L. no haziness of O. D., but whole of it paler than R., especially outer part. In both white lines as before on O. D. only.

The knee-reflexes are good.

A similar case is referred to in Hutchinson's paper on "Tobacco Amblyopia" (Alex. W—, Case 50, 'Ophth. Hosp. Rep.,' vol. viii).

What is the connection between these and the ordinary cases of tobacco poisoning? Is it only a question of degree, one being a severe, and the other a more mild effect of the drug?

It seems to me that the occurrence of the juvenile tobacco cases among several members of a family forms a connecting link between the above isolated cases and the undoubted examples of Leber's disease in whom there is no tobacco history. In Cases 1—6 I have included several, and I wish to lay stress upon the character in these cases of the affection of the optic nerve, for (regarding them

merely from the tobacco side of the question) they are all of this aggravated and stationary type of amblyopia, and, as in the isolated juvenile examples, present appearances of partial atrophy of optic nerve.

The last connecting link is supplied by cases of central amblyopia occurring in several members of a family in which some are smokers, some non-smokers.

Mr. Hutchinson's well known case (from 'Ophth. Hosp. Rep.,' vol. vii, 1871–73) quoted by Leber, is an example of this kind.

A woman, aged forty-three, applied to him with symptoms of amblyopia precisely similar to those of the tobacco cases, and presenting white atrophy of optic discs. On inquiry it was found that one of her sons had been under Mr. Hutchinson and a nephew under Mr. Hulke, and both these cases (young men) had been diagnosed as tobacco amaurosis.

Cases 3 and 4, which I have narrated are also of this character.

Mr. Hutchinson, in commenting on the above case ('Ophth. Hosp. Rep.,' vol. vii, p. 170), expresses an opinion that "when tobacco causes blindness, it does so in virtue of an idiosyncrasy, and that it is by no means improbable that such idiosyncrasy will be found occasionally in several members of a family, and that it may manifest itself in response to more than one kind of exciting influence. Thus, in the young smokers, tobacco is the cause, while in the case of the woman aged forty-three, it is the disturbance due to the decline of the menstrual function."

I should go further than this, and say that when tobacco causes blindness in two or more members of a family it is an indication that more than the tobacco influence is present, that there is some cause of general enfeeblement which is common to all, and that the toxic effect is exerted in a person who already possesses an inherited morbid weakness of optic nerves, a neurotic diathesis, which lends itself to any exciting influence. For proof of this I would suggest first, the occurrence of

a similar disease in several relatives (as in Hutchinson's case), one or two of whom are exposed to the tobacco poison, the others (as in the woman) not. Secondly, that these tobacco cases which *do* occur with a family history of a similar complaint are none of them ordinary cases. Either they present a greater amount of atrophy than is usual, or without presenting more than slight pallor of disc, they do not recover, but though not losing their sight completely remain, with permanent impairment, as in the numerous cases described by Leber,—that in fact there is present something more than the tobacco idiosyncrasy.

It is true that the temporary combination of two conditions, namely, some depressing nervous influence, as well as that of tobacco, is to be found in many of the histories of ordinary amblyopias (such, for instance, as intemperance, mental worry, sexual exhaustion, and in one case I find reported nervous shock due to a railway accident); but these do not as a rule produce a non-retrogressive and stationary type of cases when the smoking is discontinued.

For this reason, therefore, I think we are justified in concluding that these isolated examples in juvenile smokers and others present a very close alliance with the family cases of Leber's disease. In both there is a susceptibility to the influence of tobacco stronger than usual. In the former it is a personal idiosyncrasy, meeting, in some at least of the cases, with a combination of depressing influences (for example, tobacco plus the exhaustion induced in these so-called sexual cases), this outside factor being probably the stronger of the two, whereas in the family cases the personal susceptibility is the expression of a strong inherited tendency, which is the greater factor, the tobacco influence taking a lesser share, but the resultant effect being the same in each. The latter (and I refer chiefly to the Cases 1—6 which I have added to the previously published examples) are not all hereditary in the strict sense, but the coincidence

of collateral cases points equally, I believe, to an inherited tendency.

The conclusions I come to are, therefore, that in a certain class of cases there is an hereditary predisposition to an affection of the optic nerve, that this taint does not, so far as is proven, depend upon consanguineous marriages among any of the ancestors, and that in some of the sufferers there is a tendency to other affections of the nervous system, for the most part functional.

Next, that in individuals possessing such a neurotic diathesis one or more exciting influences may determine the affection of the optic nerve.

That amongst others the influence of the sexual system is probably shown by the occurrence of the disease in a large number of the cases at the period of life at which disturbances of the nervous system most commonly result from this cause, namely, at or about the age of puberty, and at the age (in women) when the sexual functions cease (the menopause) ; that in other cases abuse of the sexual functions may exert a prejudicial influence, and that this is illustrated by the occasional occurrence of isolated cases presenting a similar central amblyopia, in which no cause but the sexual excess can be found to explain the atrophic change in the optic discs.

That it is possible that syphilis in one or two instances may have been the determining factor, but that this combination may be accidental, and as an excitant is at least very doubtful.

Finally, that the toxic effect of tobacco (and possibly of alcohol, though there is no proof that this alone will produce optic atrophy) will, in the cases of individuals with this peculiar nervous diathesis, produce, instead of the milder and retrogressive form of amaurosis (which is common in persons with merely a susceptibility or idiosyncrasy to tobacco), a progressive neuritis leading to optic atrophy and a failure of vision, which, though it comes to a standstill at a certain point, seldom if ever becomes improved when the exciting influence is cut off.

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(*October 20th*, 1887.)

* Above is from Leber's paper in 1877.

2. *Optic atrophy in three brothers (smokers).*

By Edgar A. Browne.

Case 1.—J. —, æt. 40, eldest of a family of five, three males two females, was seen thirteen years ago with failing vision; was then told he was suffering from tobacco. Previous to this time he had splendid sight, never had a day's illness in his life, never had headaches. He was a sailmaker on board ship. Used to smoke ½ oz. twist daily, and chewed about the same amount. After being warned he dropped the smoking, but not the chewing. At present pupils equal, act to light, pronounced external squint in L., but good power over internal rectus. Fairly good knee-jerks, right a little difficult to produce.

Sees flame or bright reflexion from white surface, generally best in peripheral portion of retina; is very uncertain in his answers. O. D. Typical skim-milk atrophy, vessels small. Slight raggedness at margin of L.

Case 2.—W. —, æt. 33, blacksmith. March 16th, 1888: V. good till six months ago; failure gradual. Smoked 1 oz. twist weekly, chewed indefinitely, sees a good deal better in twilight (volunteered statement); general health very good, knee-jerks good, pupils 3 mm., act to light. Tested with a bright piece of white paper, sees it best in R. outer and lower peripheral field, L. inner and lower. Does not see at all centrally. O. D. General appearance of recent atrophy, vessels small but pervious, arteries rather tortuous.

Case 3.—C— (October 13th, 1886). Eyes have felt "irritative" three months. V. failed two weeks; one month ago is certain he could read the newspaper.

V. R. 2 %. 16 J.
V. L. 2 %. 14 J.

Refraction slightly my., not improved by any minus glass. Heavy smoker, teetotaller. Pupils equal, act to light and accommodation. Field of V. normal, white and red-colour vision (wools) normal. No scotoma discovered.

December, 1886.—I note a very amaurotic appearance ; finds no difficulty in going about, sees better in the dark. Tested for scotomata gave very uncertain answers ; red seems dull a little above fixing point. Field generally normal for white and colours. O. D. well nourished. V., R. E. = 16 J., no improvement after inhaling amyl nitrite.

March 16th, 1888.—Pupils equal, rather sluggish, act to light. Fields, R. E. white, normal. In the L. a scotoma for white nearly positive. In R. E. scotomata for red. V. = 16 J. at 4″, R. E. O. D. pale and smooth, veins perhaps a little large.

Cases of this kind may be regarded from two points of view, (1) in relation to the part played by tobacco, (2) in relation to the classification of atrophy. The original assumption that tobacco caused "white atrophy" has been of late years discredited in proportion as the significance of axial neuritis has become recognised, and something like scepticism as to tobacco giving rise to atrophy at all has replaced the former belief. The evidence on which a final judgment can be formed is not yet complete. These cases clearly belong to the class of hereditary optic atrophy of Leber, but I should plead against the adoption of the term "hereditary" till our knowledge is more accurate than it is at present. Terms involving a theory are always to be adopted with caution, and in the present instance there are reasons for supposing the term "hereditary"—vague enough in ordinary employment—may be in this connection positively misleading. In a certain sense most disease is the gift of a man's ancestral constitution, and the inheritance of one or more localities of least resistance is common to all mankind. The liability

to harm by external agencies without distinct constitutional proclivities scarcely implies heredity in a particular sense. It seems probable there may be two classes of cases. One (comprising Leber's) in which a process of destruction takes place spontaneously at a comparatively early age in several members of the same family, another in which the influence of a toxic agent is traceable. To this latter the term hereditary is not strictly applicable. But a sufficient number of cases might easily be recorded to afford us material for classification. The first point to be cleared up is the part played by tobacco as the determining agent. In these cases it seems to be the active cause. All were heavy smokers, practically teetotallers (alcohol may be entirely excluded), none had any perceptible neuritis, none had cerebral nor spinal symptoms. No other members of the family or collateral relatives have suffered from early failure of sight. The sisters, non-smokers, escape.

The distribution of the visual perception—such as it is—even now corresponds with the onset of tobacco amblyopia, being in all better towards the periphery than at the centre. Assuming, for the sake of argument, that tobacco causes an axial neuritis, and that these were originally tobacco cases occurring in persons with a remarkable intolerance of tobacco, and also with a remarkable tendency to nerve degeneration, we may take them as types of one group, viz. those in which an axial neuritis being once established, tends to spread to the peripheral fibres involving both sets in the subsequent atrophy,—exactly the opposite of what occurs in the atrophy consecutive to ordinary neuritis. The microscopical examinations of Edmunds and Lawford show the peripheral (meningeal) origin of ordinary neuritis, and clinically we know the central fibres often escape. It is well known that central vision is unimpaired during the whole course of marked neuritis, notably in syphilitic cases, which recover under iodide. But in cases which go on to atrophy the central fibres become involved. So that although the two tracts

are physiologically separated and liable to be separately attacked, yet a process beginning in the central may spread so as to involve the peripheral and *vice versâ*. It appears, then, that groups of types of cases like the following may be provisionally admitted.

1. The ordinary tabacco amblyopia, involving only the central fibres, transient and passing on to resolution on removal of the cause.

2. A class of retrobulbar neuritis, beginning with negative central scotomata, but which do not tend towards recovery, the central defect progressing to such a degree that axial atrophy may be assumed, peripheral vision remaining unaffected. The *rôle* played by tobacco or other causes in these cases requires investigation.

3. Such as the cases under consideration, where the affection begins in the central tract, but gradually spreads peripherally till the whole nerve is more or less involved, and atrophy results. Here a distinct personal proclivity is shown in young persons, members of the same family. Whether there is any ascertainable difference between those cases in which tobacco is the exciting cause and those which occur spontaneously requires investigation. Evidence is yet incomplete on the subject of other toxic causes beyond tobacco, and the constitutional causes are not noted.

4. Atrophy consecutive to neuritis, meningeal and peripheral.

5. A degenerative atrophy without neuritis occurring in conjunction with disease of the sensory columns of the spinal cord, sometimes anticipating in point of time, sometimes late, but following the same law of travelling from the peripheral termination towards the centre, and reminding us that the optic nerve more nearly resembles a tract of the spinal cord than an ordinary sensory nerve. These two last groups have been clinically well studied, but the three first have been imperfectly studied, and will repay further investigation.

(*June* 14*th*, 1888.)

Dr. Herbert Habershon considered that this interesting group of cases, though collateral only, afforded an example of the influence of heredity, though not perhaps so strong as in families where individuals of two or more generations were attacked. He believed that though they should be regarded as instances of Leber's disease they formed a connecting link between the more marked cases where the affection appeared in several generations, and those isolated cases of juvenile tobacco amblyopia which were non-retrogressive and ended in partial atrophy of the optic disc. In all the tobacco cases there was evidence that more than the toxic effect of tobacco was present, and that there was a predisposition or an inherited weakness of this part of the nervous system. Amongst the cases reported in his paper on the subject at the beginning of the session were several given to him by Mr. Nettleship, in which brothers and sisters were the subjects of optic atrophy, some being smokers, while others in the family, also affected, were non-smokers. This seemed to afford proof that the tendency in all was the same, but called forth by a different exciting cause. In many of the cases which occurred at the age of puberty or thereabouts it seemed probable that disturbance of the sexual system had some influence, and in fact the only cases of central amblyopia similar to these cases of Leber's disease which he had been able to discover (besides the cases of tobacco amblyopia) were some in which the eye affection was attributed to sexual excess. Mr. Power had shown in his recent papers that this influence was a potent one in some diseases of the eye.

3. *Toxic amblyopia.*

By Dr. van Millingen.

(Communicated by R. Marcus Gunn.)

In his 'Practical Treatise on Ophthalmology,' Mackenzie, when referring to blindness caused by the use of tobacco, says :

"It is difficult, of course, to prove that blindness is owing to any one particular cause, when perhaps several causes favourable to its production have for a length of time been acting on the individual."

This sentence of our great ophthalmologist seems to me to have as much force of meaning to-day as when it was pronounced, for notwithstanding all that has been said and done on this subject, we are not yet in a position to prove to what extent a given case of amblyopia is dependent on abuse of alcohol or of tobacco. Persuaded that the Ophthalmological Society of the United Kingdom will take an interest in any facts which may help to elucidate this subject, I venture to lay before it the result of fifteen years' observation in Turkey, a country where 160,000,000 lbs. of tobacco are disposed of by the Government, and perhaps as much is smuggled into the market, a country in which the women smoke as much as the men. You are also aware, gentlemen, that the majority of Turks, true to the precepts of the Koran, do not touch alcoholic drinks, and that the women, whether they be strictly religious or not, are never known to drink. I can positively affirm that I have never known a Turkish woman to drink, and I have never heard of such a thing throughout Turkey and the Levant. The native Christians, who for more than four centuries have been in contact with the Turks, have in many respects adopted their ways and habits of life, and although their women smoke to excess they never indulge in alcohol.

I said that the majority of Turks do not drink. There is, however, a class of Turks (the official Turks) forming a small part of the population of the capital and principal provincial towns who indulge in "raki" (almost pure spirits flavoured with aniseed and mastic gum); and they are in the habit of getting drunk regularly every evening. These Turks only drink in secret, and consequently do not go about in drinking houses, where they might get other drinks than "raki." I mention these facts because I have observed that "raki" drinkers are not the subjects of delirium tremens or even of alcoholic habitus. They generally become plethoric, but are not liable to cirrhosis and dropsy. The face and nose never take the characteristic appearance of the wine or brandy drinker.

Now, in a field which at first sight would appear to be a very favourable one for the development of toxic amblyopia, what are the plain unquestionable facts based upon long and close observation? They are such as to give a perfectly negative result, for I have never seen a single case of central scotoma in a Turkish man or woman.

The only inference I can draw from these facts is:— That the absence of central scotoma in this class of people is due, either

(*a*) To the quality of tobacco, or

(*b*) To the manner in which it is smoked.

I shall make some remarks on these two points.

1stly. The quality of tobacco. Shag, which according to Hutchinson is most frequently the cause of tobacco amblyopia, contains 6·87 per cent. of nicotine. Turkish tobacco contains from 3 to 4 per cent., but, as Cohn has observed, it is not the quality but the quantity which must be considered. He cites a case of tobacco amblyopia coming on after smoking very light cigars with 1·8 per cent. of nicotine, although before his complaint the patient was in the habit of smoking the same number of stronger cigars, containing 2·02 per cent. nicotine, and that for more than forty years. The weaker cigars turned out to be much larger and heavier. It was calculated that he

had taken 1·944 parts of nicotine when his amblyopia occurred, whilst formerly, although smoking a stronger cigar, he was only taking 1·142 of nicotine daily.

Taking it that the smallest amount of shag which is known to have produced amblyopia is ½ oz. a week, giving off 2·3 parts of nicotine, it will at once be evident that a Turk, smoking at the lowest estimate ½ oz. of tobacco per day, amounting to 3 or 4 grammes of nicotine per week, will stand twice as much risk of getting poisoned as would a shag smoker. I have thus attempted to prove that immunity from tobacco amblyopia in Turkey is not due to the quality of tobacco.

2ndly. The manner in which the tobacco is smoked. Turks as a fact smoke differently to Europeans. In the first place they smoke only cigarettes. The nargileh and pipe are almost quite out of fashion. The cigarette is carefully prepared so that the mouth end is free from tobacco. Only the paper comes in contact with the lips. The cigarette is held between the index and middle finger, and brought to the lips for a puff, and then withdrawn. If a filament of tobacco gets into the mouth it has to be expelled at once, for it gives rise to much more irritation than that produced by the leaf of a cigar. The cigarette is never taken far into the mouth, or between the teeth, but is only held loosely between the lips. Each mouthful of smoke is inhaled by a deep inspiration into the bronchi and lungs, and is brought out with the next expiration.

In this peculiar way of smoking there is no possibility of nicotine being absorbed by the buccal mucous membranes. If nicotine were conveyed *by the smoke* into the system, it appears to me that its effect would show itself more on Turks than on other smokers. Judging from these facts it is only natural to suppose that tobacco poisoning is only possible when nicotine in solution is brought into contact with the mucous membrane of the mouth and swallowed.

As to alcoholic amblyopia—in which I firmly believe

it is evident that certain kinds of drinks, amongst which I would count raki, do not bring on amblyopia, otherwise I should certainly have seen cases in raki drinkers —the following cases which I have obtained at Constantinople, the victims all being foreigners, are worthy of note. They represent, 1stly, eight cases of alcoholic amblyopia; in two of these cases the fields were taken with care.

In Case 1, with V. $\frac{2}{60}$ in each eye, the field was concentrically contracted for colours only. Red between 20° and 30°; green between 10° and 25°, and yellow and green to 5° around the fixation point. The contraction in the other eye was not precisely the same but very much like it. This patient drank red wine to excess, but was not a smoker. Details are given below.

In Case 2 there is a large central scotoma for red and green, and some peripheral contraction for white and all colours, V. $\frac{6}{200}$. The patient was not a smoker, and drank brandy to excess. He showed signs of chronic alcoholism, with tremor.

The amblyopia was symmetrical in all the cases. Central scotoma with red-green blindness, was present in five out of the eight. The other three had central scotoma without loss of perception for red and green or blue and yellow.

The proportion of alcoholic amblyopia cases at Berlin is 4·37 per cent. of all cases; that of Paris is 1 per cent., and I have calculated it to be only 1 per mille at Constantinople. I have only met with it in *wine, cognac,* and *rum* drinkers.

The only cases of tobacco amblyopia which I have seen at Constantinople (two in number) are the following. (See Cases). It will be noted that both were foreigners; the one smoked five cigars daily, the other a big German pipe, which he kept in his mouth all day for years. No. 1 drank one glass (pint of wine) before going to bed. He was cured by stopping his wine, and hypodermic injections of strychnine. Case No. 2 did not

Probable Cases of Tobacco Amblyopia.

No.	Name.	Age.	V.	Fundus, and general state.	Field of L. E.	Field of R. E.	Tobacco, alcohol.	Remarks subsequent to admission.
I	E. Mannhardt, 8th March, 1887, watchmaker	40	R. $\frac{6}{36}$ L. $\frac{6}{36}$ since some weeks	R. E. small; superficial atrophy of choroid at outer part of optic disc. Refr. Em. L. E. normal. Sallow, urine normal. Complains of being dazzled when working with bright metals; he is dazzled if he looks at colours. "I have seen brilliant sparks ever since my sight began to grow weak"	(See Chart, fig. 1)	(See Chart, fig. 2)	Smoked 5 cigars daily. Took 1 glass of wine before going to bed to counteract insomnia. Eats little as he cannot afford to get enough. He lives principally on coffee	Ordered to drop wine, take nourishing food, smoke moderately, at most 4—5 cigarettes, no cigars. Strychn. injections daily; gradual improvement to 1st July; he is able to resume work. Strychn. injections are continued twice weekly. 15th Nov.—V. $\frac{6}{9}$; colour-perception normal. The patient has considerably improved in general health.
II	Herr Holtz	65	R. $\frac{6}{60}$ L. $\frac{6}{60}$ Em.	Normal; fine striæ in periph. of R. lens	Central scotoma extending to 10—15°; completely colour-blind in scotoma		Heavy smoker of pipe. Drinks nothing	Stopped smoking. Strychn. injection daily for 2 weeks. No improvement. Believes his weakness of sight came on after exposure to sun 6 months ago. Takes again to smoking. Stops coming. The same 3 months later.

I.	Josef Kistner, 3rd April, 1887	44	R. L. $\frac{2}{60}$	Fundus.—Whole surface of discs somewhat pale. Trembling of fingers; has lost flesh lately; no appetite; constipation; giddiness. Reflexes normal. No albumen or sugar. Sees better in shade; sunlight "dazzles him too much"	(See Chart, fig. 3)	(See Chart, fig. 4)	Red wine to excess. Does not smoke more than a couple of cigarettes daily	Stopped his drinking altogether. Strychn. injections; laxatives. Smoking allowed. 7th April.—V. $\frac{2}{24}$ o. u. 5th May.—V. $\frac{6}{24}$. 28th June.—V. $\frac{6}{9}$, both eyes; colour-perception normal; field normal. General health much improved.
II.	Herr Sagehorn, 30th March, 1887	36	R. L. $\frac{6}{200}$	Outer half of O. Ds. pale; tremulous; alcoholic look, strong smell of alcohol (11 o'clock a.m.). At first he denies, then he admits, one glass brandy of a morning "to keep his hand steady" when writing	Red blind in scotoma; green perception very doubtful; blue and yellow normal (discs 1 m. square). In the clear parts of F. colour-perception is good. There is some contraction for white at temporal extremity (See Charts, figs. 5 and 6)		Brandy, every morning several small glasses. Beer several times a day. Brandy again in the evening. Wine at table since 4 years. No smoker	Refuses to come to Infirmary. Not seen again. Heard of him 4 months later. Drinks as much as ever. His sight is the same.
III	Giuseppe, 1st March, 1880	58	R. L. $\frac{2}{200}$	Normal. Arter. hyal. persistens in both eyes. Strong smell of alcohol; tremulous	Normal, scotoma as in R. E.	Normal in the periphery; a central scotoma difficult to limit; colour-perception is good at the centre of the scotoma	Wine, brandy, to excess. Not a smoker. Drinks since many years	Stopped his drinking. Strychn. injections. 8th March.—V. $\frac{14}{60}$. Wishes to leave, craving after drink.

No.	Name.	Age.	V.	Fundus, and general state.	Field of L. E.	Field of R. E.	Tobacco, alcohol.	Remarks subsequent to admission.
IV	Christo, 10th June, 1880	58	R. } $\frac{14}{200}$ L. } 15 J. with +2 D.	Discs pale all over. O. D. venous pulsation. Plethoric	Central scotoma for red-green		Drinks wine to excess; is frequently intoxicated; since 15 years. Does not smoke	Stopped his drinking. Hypodermic injections of strychn. 14th June.—V. $\frac{14}{100}$. 15th June.—V. $\frac{14}{50}$. 10th July.—V. $\frac{6}{6}$.
V	Mons. Lambeille	58	R. } $\frac{6}{200}$ L. }	Normal. Catarrh, conj. and bronchial	Small central scotoma for red and green		Wine, cognac, to excess; since years. Never smokes	Stopped drinking. After 2 injections of strychn. V. $\frac{14}{100}$, and after 3rd injection $\frac{14}{70}$. After 25 injections V. $\frac{6}{12}$. Colour-perception nearly normal.
VI	Antoine Bonfort	44	$\frac{6}{18}$, both eyes	Normal	Central scotoma. Colour-perception normal		Drinks wine, brandy, all day, a glass now and then. Smokes a few cigarettes, 4 or 5 a day	Admitted. Wine and alcoholics prohibited. Cigarettes allowed. Cured in 6 weeks with subcutaneous injection of strychn. V. $\frac{6}{6}$ on dismissal.
VII	Felix Taschen	42	R. } $\frac{6}{18}$ L. }	Normal. Alcoholic look; strong smell of alcohol	Central scotoma. Red-green perception weak. Cannot read Pflüger's red-green tests		Brandy and wine; frequently drunk. Smokes occasionally and little	Is disheartened when told that he must give up drink. Is not seen again.
VIII	Dr. Z—a	44	R. E. $\frac{3}{36}$	Normal. T. n. L. E. acute glaucoma. Liver cirrhosis. Delirium tremens. Sallow look	Central colour scotoma for red and green	Nasal part wanting owing to acute glaucoma	Very heavy drinker of rum and wine; always half drunk. Never smokes	Will not submit to operation or any other treatment. He is busily engaged in writing on the treatment of wounds by his method, and is sure that every Government will reward him for his invention.

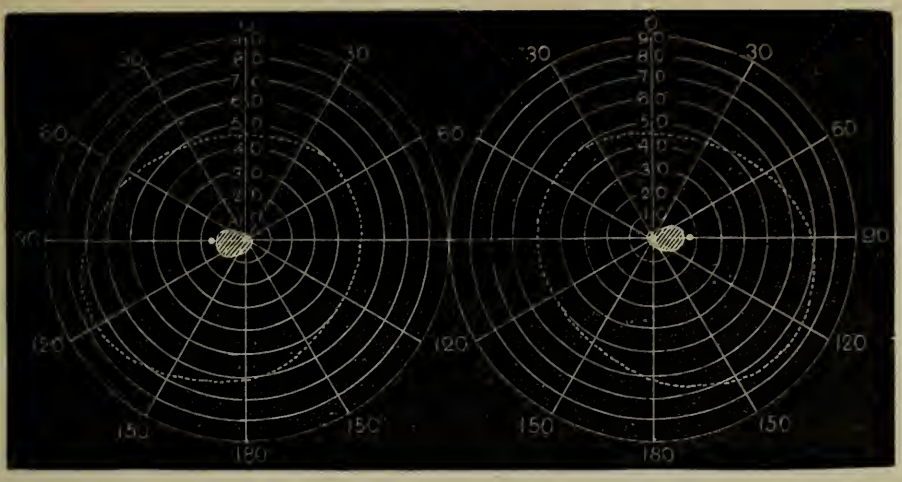

FIG. 1. FIG. 2.

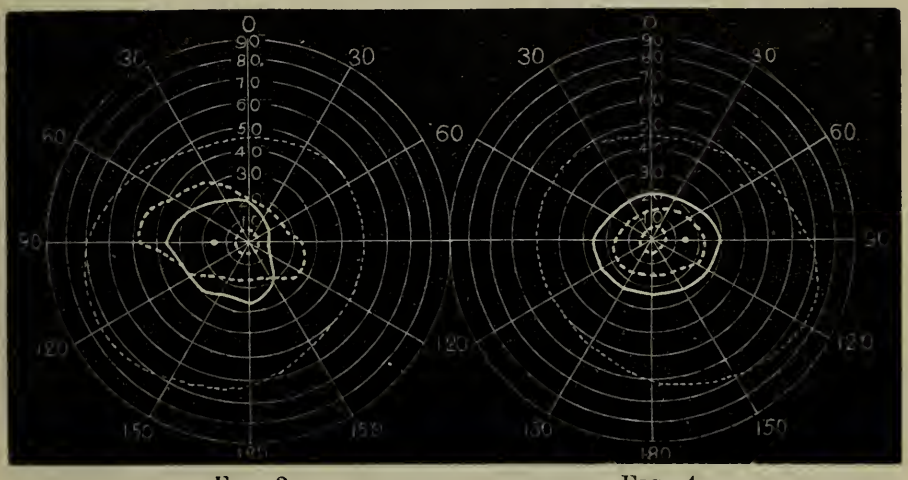

FIG. 3. FIG. 4.

Blue and yellow..... Green - - - - Red ———

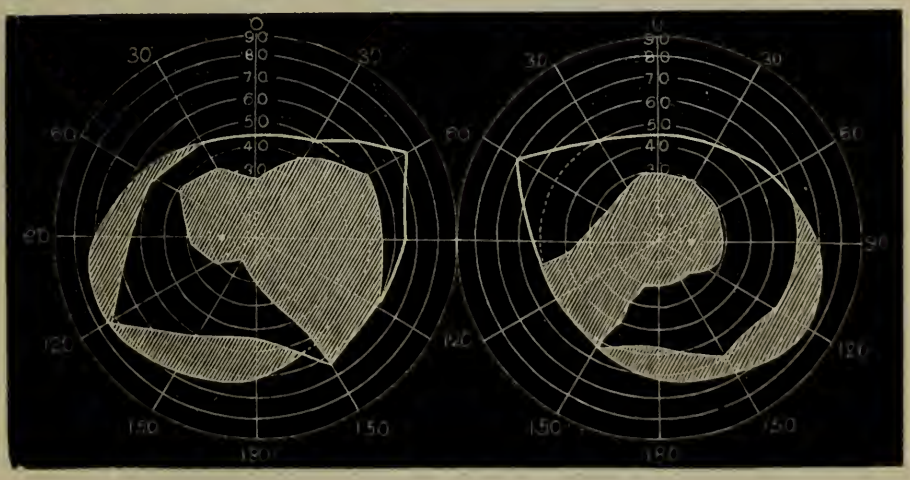

FIG. 5. FIG. 6.

Red—blind in scotoma. Green—perception very doubtful. Blue and yellow normal. Some contraction for white at temporal extremities.

improve, although he stopped his smoking for two weeks, which of course was not long enough to be a test.

(*January 26th*, 1888.)

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4. *Retro-bulbar neuritis (?).*

By Henry Juler.

Elizabeth P—, æt. 26. Married five years; mother of three children, all living; the youngest child was fifteen months old and still at the breast when the present attack commenced. Patient is a healthy-looking, fair person, and has previously enjoyed good health. About September 19th, 1887, she became weak, and suffered from sore-throat and subacute rheumatism. The throat was said to be ulcerated, the rheumatism affected the wrists, knees, and ankles, which were stiff, swollen, and painful. On September 30th, as she seemed to be recovering from the rheumatism, and was beginning to get about again, she was seized with sudden severe pain in both orbital regions; this was increased on the slightest attempt at movement of the eyes, and lasted for twenty-four hours. The eyes were not red. On the following day, October 1st, the pain ceased, but the vision became exceedingly dim; in the morning everything became misty in appearance, and by the evening she was so blind that she could not count fingers, nor could she perceive the position of a lighted candle in the darkened room. This condition of blindness lasted for five or six days. There was no loss of consciousness, nor does she seem to be in any way hysterical.

On October 5th she came to London, and was admitted as in-patient at Moorfields Hospital. She states that she was there informed that the affection was in the brain, and that she was sent to the hospital for paralysis.

She first came to St. Mary's Hospital on October 7th,

at which time there was good P. L. in each eye, but she was unable to count fingers. There was atropine mydriasis. There was a very slight haziness of each optic disc, and slight pulsation of the retinal veins. No tenderness on pressure of globes. No pain. T. n. Quinine mixture was prescribed, and blisters to each temple. She was ordered to wean the baby and to take liberal diet.

From October 7th till 18th there was steady improvement of the vision. There was then slight myopic astigmatism, but with the correcting glasses V., R. $= \frac{6}{18}$; V., L. $\frac{6}{24}$. The appearance of the fundi presented nothing abnormal beyond a very slight pallor of each disc. The visual fields could not be traced until October 12th, at which date there was slight contraction for white, non-perception for red and green, whilst blue could be just detected at 20° from the centre, but not at the centre. On the 16th and 18th the fields for white were still slightly contracted, the fields for blue, red, and green were also concentrically contracted; there was no central scotoma, although the most careful examination with small discs was made. The general health was much improved. The sudden loss of vision in this case, combined with the previous severe pain in the orbits, which was increased on movement of the eyes, and the preceding subacute rheumatism, appear to indicate pressure on the optic nerves by rheumatic effusion into their sheaths, either in the orbit or in the optic foramen.

October 20th, 1887.

Mr. Mackinlay said that Mr. Juler in his remarks had modified the description written on the card of the present condition of the patient's eyes, for there it was stated that each fundus was normal. Mr. Mackinlay did not consider they were; he thought that the margin of each disc was blurred, and that there was also distinct retinal haze in each eye, and that the conditions indicated that there was more clearing away to be done.

5. *Neuritis after measles.*

By S. H. A. Stephenson.

Thomas W—, æt. 4.

History.—Patient has been continuously under observation since November, 1886.

An ophthalmoscopic examination was made on January 5th, 1887, when a note was made to the effect that his fundus was normal.

In May, 1887, he contracted measles. The attack was of a mild type, the temperature falling to normal on the fifth day of illness, and remaining so until his discharge —forty-three days after commencement of the disease. No complication of any kind was present.

On July 5th, 1887—ten days after the patient had left the measles ward—it was accidentally found that he had double optic neuritis. The condition at that time was as follows:—"R. E.: Disc is swollen (+ 4·0 D.), is of a greyish colour, and has a striated appearance; its margin is ill-defined, blending with surrounding parts. The retinal veins are too large, and on the fundus become very tortuous; at the lower inner part of the disc a swollen vein makes a large twist, which roughly resembles the letter S. The vessels appear foreshortened, and parallactic movements can be elicited. No hæmorrhages.

L. E.: Disc is rather better defined and not so much swollen as is its fellow (+ 2·5 D.). Veins relatively to arteries are rather too large, but they are not so large as are the veins in the R. E.

V. = fingers at 16 metres with either eye.

Refraction $\frac{+\ 0{\cdot}5\ \text{Sph.}}{+\ 2{\cdot}5\ \text{Cyl. } 90°}$.

Seems perfectly healthy. No headache, vomiting, or pain anywhere. Pulse and temperature normal. Urine acid, no albumen.

Since the date of the above report patient has been kept under close surveillance, his temperature has been recorded twice daily, &c., but nothing in any way wrong with his general health has been discovered.

Present condition.—Pupils equal, in ordinary light their diameter is 2·5 mm., their direct and indirect reflex action appears to be normal, and they act to accommodation.

V. = fingers, with either eye, at 16 metres.

Refraction = compound hypermetropic astigmatism—

+ 1·0 Sph.
+ 2·0 Cyl. 90°.

R. E.: Optic disc protuberant (+ 4·0), of a greyish-white colour and striated, its edges ill-defined. There appears to be organised tissue about its surface, with delicate whitish striæ crossing and running parallel to the central vessels. Veins to arteries as two to one. No hæmorrhages. The disc is paler than it was on July 5th, 1887.

L. E. (minute opacity near posterior surface of lens): The neuritis is not so well marked as in R. E. The disc slightly swollen (+ 2·0), and more defined and paler than it was on July 5th, 1887; its nasal is more defined than its temporal side. Veins to arteries as four to three. No hæmorrhages.

(*May 3rd*, 1888.)

XI. AFFECTIONS OF MUSCULAR AND NERVOUS SYSTEMS.

1. *Recurrent hysterical ptosis (right) becoming actual; removal of semilunar strip of skin; cure.*

By W. J. Collins, M.D.

(With Plate IV, figs. 3 and 4.)

Alice Maria L—, æt. 23, a teacher, always had good health. In 1879 suffered from a transient attack of symmetrical ptosis; treated at Moorfields; recovered rapidly. A second attack in 1880 lasted eight months, and eventuated in complete recovery. In September, 1882, she again began to suffer with ptosis of right eye, and when this was incomplete, with vertical diplopia. She is small, stunted, with misshapen head, and weak though hardly hysterical, behaviour. Was in-patient at St. Bartholomew's 1882 (vide 'St. Bart. Hosp. Rep.,' vol. xix, 1883, p. 282). When suddenly awoke from sleep on three occasions she opened both eyes equally and well, and moved them freely in all directions. There was, however, no suspicion of the genuineness of her symptoms; she was very anxious to be cured in order to resume her occupation. Galvanism, faradism, extraction of carious teeth, and many anti-hysterical remedies were tried without success. The ptosis of the R. eye became persistent and nearly complete, though the epicranius effected some elevation of the lid when it acted vigorously. In 1887 she was in the same state, and was admitted under my care at the North-West London Hospital. I removed a semilunar strip of skin from the R. upper lid, with very satisfactory cosmetic effect.

(*Card specimen. May 3rd,* 1888.)

2. *Pseudo-ptosis from paralysis of left occipito-frontalis.*

By W. J. Collins, M.D.

(With Plate IV, fig. 2.)

Louisa L—, æt. 21, married two years, never pregnant, looks delicate and fatigued. Has been subject to epileptiform seizures during last eight years; last attack six months ago; does not bite tongue in attacks. For the last four weeks has had pain at back of eyes and dimness of vision; a fortnight ago the left upper eyelid began to droop, and eye was quite closed. It is better every morning, and always gets worse towards evening. There is slight diplopia sometimes. No history of traumatism, teeth not defective nor carious; catamenia regular.

Present condition.—L. eyebrow 1·5 cm. lower than R., and less of the "bended bow," giving appearance of pseudo-ptosis; when brow is raised, however, the upper lid can be elevated quite normally. Skin of the lids dusky and pigmented. Can knit brows normally (corrugator supercilii) and furrow the forehead on the right side horizontally; not so on left. Pupils equal and active; media clear; fundi *nil* abnormal; no loss of sensation; no other palsy, though accommodation is weak, left eye 8 J. at 22 cm. $\bar{c}$ + 1·50 D. J. 1 at 22 cm.

V. R. $\frac{6}{6}$ $\bar{c}$ + 1·25 D. = $\frac{6}{6}$.
L. $\frac{6}{12}$ (letters) $\bar{c}$ + 1·25 D. = $\frac{6}{12}$.

Greatly improved by change of air and iron tonics.

This case is presumably one of peripheral neuro-muscular palsy. It is interesting as bearing upon the remedial operation for ptosis based upon the utilisation of the lid-elevating power of the frontalis in place of the levator palpebræ.

(*Card specimen. May 3rd*, 1888.)

3. *Case of paralysis of sensory branches of right fifth nerve, with cataract, and without any corneal change.*

By W. J. Collins, M.D.

John G—, æt. 58, labourer, gives the following history: Nine months ago, while digging, he was suddenly seized with sharp pain, referred to the neighbourhood of the right outer canthus. This pain, sometimes of excruciating severity, has continued with slight abatement and short remissions ever since. Before this attack his health was excellent; he had had no premonitory headache, never had a fit, denies syphilis, and inherits a gouty history.

At the present time he looks a healthy man, but in pain. He has a full pulse, no cardiac murmur, some emphysema of lungs. Urine sp. gr. 1012, acid, no albumen. He still complains of pain over the right brow, and along the right malar bone, but on testing his sensation it is found that the whole area supplied by the three sensory trunks of the right trigeminal is anæsthetic, thermanæsthetic, and analgesic. This area extends nearly, but not quite, to the middle line of the face; for 1 or 2 cm. to the right of the middle line he is uncertain and inexact in his answers as to feeling or not. On the scalp the anæsthesia extends over the summit of the cranium, nearly to the lambdoid suture; laterally it reaches the pinna, but does not invade it. The quantitative testing with compasses reveals no disagreement between the minimal distance of two points felt as two on the two ears. Vibrissæ were plucked from the right nostril without any disagreeable experience. My colleague Mr. Maggs extracted two carious stumps from the right upper jaw with some difficulty but without the least pain. The mucous membrane of the right cheek, hard and soft palate, and tonsil, and of the right side of the tongue and lips, is entirely devoid of sensation. The

right half of the tongue is smaller than the left, and is coated with a brownish-grey fur, chiefly consisting of a rich overgrowth of epithelium. He does not taste mustard, pepper, acetic acid, or quinine when applied to the right side of the tongue. He has considerable difficulty and even anxious distress in deglutition, especially with liquids; he is in constant fear of being choked, and makes powerful and eager gulping efforts in the process. By laryngoscopic examination I found an accumulation of saliva hanging about the base of the epiglottis and overflowing into the larynx, the anæsthesia of the palate, tonsils, base of tongue, and parts around apparently being responsible for the absence of the appropriate stimulus to deglutition as need and occasion arise. An œsophageal bougie encountered no obstacle in its passage. Below the lower jaw the limit of anæsthesia is sharply defined. There is apparently no motor paralysis; the action of masseters, temporal, buccinator, and pterygoids, is intact. There appears to be some palsy of the right frontalis muscle, presumably unconnected with the trigeminal lesion.

The sense of *smell* in the right nostril is not so keen as in the left.

Hearing with right ear $\frac{7}{40}$, left ear $\frac{12}{40}$.

Eye.—There is complete anæsthesia of the lids and conjunctiva; there is, I think, less lacrimal secretion on the right side than the left; there is not, and has not been, any herpes or other skin affection. There is no catarrh or hyperæmia of conjunctiva. The cornea preserves its normal pellucidity in spite of eight months' habitual exposure. The pupil is dilated, in bright diffuse daylight its diameter is to that of the other side as 9 : 5. The lens is cataractous; he noticed his vision failing since the onset of this attack; there are no distinct striæ in cortex, but a diffuse nuclear opacity is observed. Some red reflex is obtainable; the vitreous and fundus, so far as examination is possible, appear normal. V. = hand reflex. T. – ?.

This case appears to me instructive in many ways, and by no means the least for the light it throws upon the hackneyed question of "trophic" troubles consecutive on nervous lesions. The points I would lay especial stress upon are these:

a. The non-invasion of the mesial line by absolute anæsthesia. We have evidence in other parts to show that the mesial areas of the body are supplied by filaments from both sides. An observation corollary to this is found in the respect that is paid to the macular region in cases of hemiopia.

β. The fact that although there is every reason to believe that the sensorial innervation of the ear by the auriculo-temporal was withdrawn, there was no evidence either of localised anæsthesia nor of lessened acuteness of sensation in the area to which it is usually distributed.

γ. As regards the "trophic nerve" question it appears to me this case furnishes us with evidence of the highest importance.

There can be little doubt, from the entirety with which trigeminal sensation is abolished without the smallest implication of the motor root, and from the severe referred pain complained of in anæsthetic parts, that we have here a considerable lesion of the sensory portion of the fifth somewhere between its nuclear origin in the pons on the one hand, and the eventual trifurcation of the Casserian ganglion on the other. It is equally certain that it is a pathological change, not a mechanical solution of continuity, we have to deal with. Yet here, with a profound and absorbing lesion of the fifth at its very fount, with absolute anæsthesia, there is not the slightest implication of the exposed and insensitive cornea as the doctrines of Snellen and Büttner would lead us to expect, *but* in the lens, innocent of innervation, unexposed to the annoyance of foreign bodies, going on as it were under a glass case, we perceive nutritive changes eventuating in opacification. I have been unable to find any report of a case similar to this, even in those mines of clinical wealth, ' Mackenzie

on Diseases of the Eyes,' and the new edition of the 'Traité Complet."

According to Charcot, while "the most advanced physiology teaches that in the normal state the nutrition of different parts of the body does not essentially depend on the influence of the nervous system," yet "there is nothing better established in pathology than the existence of trophic troubles consequent on nervous lesions." He reconciles these conclusions by opining that it is "the irritative lesion" of a nerve, not its solution, that is the one thing needful to precipitate the so-called trophic phenomena; and he quotes the experiments of Meissner, Merkel and Schiff to show that damage of certain tracts, to wit, the innermost of the trigeminal trunk, is all-sufficient, in the absence of anæsthesia, for the exhibition of corneal disorder. This case would further tend to suggest, if we admit the cataract to be of nerve origin, and it would be flying in the face of the law of parsimony to import other causation, that particular nerve lesions may determine trophic changes in non-nervous tissues like the lens, presumably through vascular disturbance, while all the time the highly innervated, yet anæsthetic, cornea is rejoicing in its normal pellucidity.

One word as to treatment. I have given iodide and bromide of potassium in increasing doses, and morphia in local subcutaneous injection to relieve pain. I shall be grateful for any suggestions as to the nature of the lesion, any criticisms as to the localisation, and explanations suggested, and should be glad to know the opinion of others as to the desirability and probable success of extracting the opaque lens.

(*June* 14*th*, 1888.)

Mr. Pridgin Teale referred to a case of his, published in 'Brain,' which seemed to illustrate one point in Mr. Collins's paper, viz. that the effect of a central lesion of the fifth nerve, which in some cases seems to produce destructive malnutrition of the cornea, may, under certain

circumstances, remain in abeyance until called into activity by new factors. Mr. Teale's case was this: A gentleman suffering from incomplete cataract very slowly forming, was very anxious to recover useful vision, and was impatient of a long delay. Mr. Teale very slightly ruptured the capsule of the lens with one needle. Next day the corneal puncture looked purulent, the following day the cornea was opaque. Within a week the eye was extirpated. At the end of a fortnight he was aphasic, and in three weeks he was dead. The post-mortem showed an old brown clot the size of a walnut, surrounded by softened brain, in which were a series of small, recent, black clots of various sizes. Inquiry of the family drew out the fact that two years before he had fallen from a coach, and had been unconscious for an hour or two. In this case an existing brain lesion had no adverse influence over the eye until a wound of the eye excited the central lesion into greater activity, which in turn reacted upon the eye and worked its destruction.

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4. *Notes on partial ophthalmoplegia treated with large doses of iodide and mercury.*

By W. C. Rockliffe, M.D.

A. T. E—, æt. 25, clerk, consulted me May 17th, 1886, complaining of dimness of vision and pain in the right eye, when looking at near objects.

On testing with and without atropine, his vision was Emm. $\frac{6}{6}$, reads 1 J. in both. Field of vision and tension normal.

Range of accommodation R. E. 6 inch. L. E. normal. Pupil, R. E. widely dilated, fixed; L. E. normal.

He was ordered eserine and spectacles + 1 D. for close work. The pupil reacted to eserine, but the pain, although relieved, still continued on close work.

I did not see him again for eighteen months.

In August, 1887, he came complaining of internal strabismus of the right eye, with diplopia of one week's duration.

As previously, I found his vision normal. He had, however, partial paralysis of the right sixth with homonymous diplopia, the distance between the true and false image being increased on looking to the right. Both pupils were now widely dilated and fixed, but the range of accommodation was as before. There was no ptosis or affection of any other muscle of the eye or body. Fundus normal, colour sense good. Field of vision and tension were normal. No symptoms of locomotor ataxy, rheumatism, or phthisis. Denies syphilis.

I blistered him behind each ear and ordered Potass. Iodid., gr. v, ter die ; this was shortly increased to gr. vij, ter die.

September 19th. — Commenced intermittent current daily.

26th.—Eserine three times a day, and to practise oculo-muscular movements.

October 20th.—L. E. V. $\frac{6}{6}$ reads 1, near point 7 inches, far point 24 inches. R. E. V. $\frac{6}{9}$ reads 1, near point 8 inches, far point 18 inches. Rather less diplopia. Add Liq. Hydrarg. Perchlor. ʒss, ter die.

November 2nd.—Pupils only partially react to eserine.

3rd.—Commenced constant current daily.

12th.—Power of accommodation almost entirely absent near point about 18 inches in both eyes. Both pupils refuse to act to eserine, fully dilated and fixed. Constant diplopia.

20th.—Potass. Iodid. increased to gr. xxx, ter die.

December 30th.—Possibly some slight improvement. Left pupil somewhat less dilated and seems to react slightly to both light and accommodation. Right pupil fixed.

January 10th, 1888.—Seen by Mr. Nettleship, who considered the affection most likely central and syphilitic, and suggested increased doses of mercury.

12th.—Commenced with Pil. Hydrarg. gr. iv every

three hours ; this was increased to 5 and 6 gr. with no result until February 17th, when the gums became slightly tender, and the dose reduced to 2 gr. of Pulv. Hyd. c̄. Cret. every three hours.

March 24th.—Less diplopia, pupils still dilated, especially the right, very little power of accommodation (if any) in either eye.

May 20th.—Having lost his appetite, become very weak, and losing considerably in weight, all treatment stopped. His vision remained the same. Pupils still dilated but react to eserine. Internal strabismus and homonymous diplopia less. Power of accommodation increasing, especially in the left eye.

June 12th.—R. pupil 9 mm., reacts to eserine only. L. pupil 6 mm., reacts slightly to light and accommodation. R. range of accommodation 3 inches, p.p. 14 inches, p.r. 17 inches, reads 4. L. range of accommodation normal. Diplopia on slightest deviation to right of axis of vision.

This case seemed to be of interest, because of the toleration of such large quantities of iodide and mercury, and on these grounds I have ventured to bring these notes before the Society, in that he took, from November 12th, 1887, to January 12th, 1888, 4140 gr. = about ½ lb. of Pot. Iod. in two months, the average daily dose for the last six weeks being 90 gr. From January 12th to 19th he took 20 gr. of Pil. Hydrarg. a day. The following week, January 19th to 25th, took 25 gr. of Pil. Hydrarg. a day. The next three weeks, January 25th to February 17th, 35 gr. of Pil. Hydrarg. a day, making a total of 1155 gr. of Pil. Hydrarg., equal to 385 gr. of Hydrarg., the only result being slight sponginess of the gums.

The total amount taken was therefore ½ lb. of iodide of potassium, and about 1½ oz. of pure mercury without producing either iodism or ptyalism, or any marked beneficial result.

I do not propose to offer any suggestions as to the pathology, except that possibly the lesion may be in the centre (as described by Ferrier) situated in the posterior

portion of the third ventricle at its junction with the aqueduct.

One symptom, which I believe is not unusual, might be worth remarking, viz. that the pupil became dilated, fixed, and only partially reacted to eserine, prior to the loss of accommodation in each eye.

He has no symptom of other disease of any description, and is a powerful athlete. I shall be glad if any member of the Society will make suggestions as to further treatment, and the advisability of recommencing the mercurial treatment, his general health being now completely restored.

(*June* 14*th*, 1888.)

P.S.—October, 1888.—Been taking Hydrarg. and Pot. Iod. since September. L. E., pupil almost normal. R. E., decided improvement both as regards pupil and accommodation; strabismus gone; slight diplopia.

5. *Congenital hereditary defect of ocular movements.* Vide next page, under "Congenital Defects."

XII. CONGENITAL DEFECTS.

1. *Congenital hereditary defect of ocular movements.*

By J. B. Lawford.

Having had recently under my care at St. Thomas's Hospital several members of one family, who presented unusual congenital defects of the movements of the eyeballs and eyelids, I thought it worth while to bring the subject of this rare anomaly of development under the notice of this Society.

In looking up the literature of the subject, I find that there are not many published records of similar cases, and I trust that a short account of the condition, which has interested me not a little, may prove not altogether tedious to this meeting.

My own cases, four in number, include a father and three of his children, and are as follows:

(1) Henry A—, æt. 45, an insurance agent.
(2) William A—, æt. 16
(3) Elizabeth A—, æt. 13 } children of Henry A—.
(4) Minnie A—, æt 6.

Henry A— has seven children—

(1) Male, æt. 18. Left upper lid is said to droop slightly; right does not. The movements of the eyeballs said to be good. (I have not seen this son.)

(2) Male, æt. 16 (Case 2.)

(3) Male, æt. 15. Eyes and eyelids normal.

(4) Female, æt. 13 (Case 3).

(5) Male, æt. 11. Eyes and eyelids normal.

(6) Male, æt. 9. Eyes and eyelids normal.

(7) Female, æt. 6 (Case 4).

The mother of these children has no congenital defects. Nos. 1, 3, 5, and 6 have not been seen, but the account of the father, an intelligent man, fully alive to the defect in his other children, can, I think, be relied upon.

Case 1.—Henry A—, æt. 45, an insurance agent, a slightly-built, dark-complexioned man, apparently in perfect health.

He has complete ptosis on both sides. The upper lids appear short, and are thin, following closely the contour of the anterior parts of the globes.

When aged eighteen he had the upper eyelids shortened by operation. He keeps his brows constantly wrinkled in an attempt to raise the eyelids, but with very little result, and he is obliged to carry his head slightly thrown back to enable him to see below the drooping lids. There is no upward and but the barest downward movement of the eyeballs. Lateral movements are of moderate extent, about half that of normal eyes ; the internal recti act better than the external, and he can use the internal recti rather better in convergence than when one internal rectus acts in unison with the opposite external. No action of the oblique muscles can be demonstrated. There is slight nystagmus of both eyes when lateral movement is sustained; and when the right eye is covered the left shows a condition of nystagmus, without any attempt at sustained muscular action.

V. R. $\frac{6}{18}$ + 1 D. $\frac{6}{12}$ ptly. ; 10 J. at 15″ + 5 D. = 1 J. slowly at 9″.

L. $\frac{6}{36}$ + 1 D. $\frac{6}{36}$; 14 J. at 15″ + 6 D. = 1 J. slowly at 9″.

Pupils : R. 3—3·5 mm., acts well with accommodation, badly to light.

L. 2·5—3·5 mm., action as R.

Ophthalmoscopic examination.—No changes. Media clear.

The facial muscles all act perfectly, and there is no paralysis of sensory nerves. The patient exhibits no other congenital defect.

Case 2.—William A—, æt. 16. A well-developed but rather anæmic youth, who makes no complaints except of his eyes. Is at work as a pawnbroker's assistant.

Condition of ocular muscles.—Complete bilateral ptosis. No elevation of eyelids with the greatest effort, and there is no appreciable assistance obtained from the occipito-frontalis, though he keeps his forehead constantly wrinkled.

Right eye.—Usual position is one of slight divergence; patient carries his head rotated a little to the left.

There is no upward or downward movement of the eyeballs.

When told to "look up," the eye is drawn inwards, and its vertical axis is rotated slightly outwards. When the patient tries to look down the eye moves outwards to a very slight degree, but without any rotation, as would accrue from action of the superior oblique.

There is moderate outward movement. The internal rectus acts very slightly in conjunction with the left external rectus, but rather more with the left internal rectus, or when he calls upon it to act in an attempt to move the eye upwards. There is nystagmus with all attempted or accomplished movements, and indeed without such; the nystagmus is irregular, generally lateral, but occasionally there is slight noticeable rotation, the vertical axis of the cornea becoming oblique downwards and inwards, the same rotation which, as mentioned, occurs when an attempt is made to look up.

There is no other evidence of action of the oblique muscles.

Left eye.—Usual position is one of slight convergence. Upward and downward movement absent. There is some lateral movement inwards and outwards, but this is defective in both directions; the internal rectus is rather

more powerful than that of the right eye, and with its action, as with that of the external, there is slight rotation of the vertical axis of the cornea, such as occurs in the right eye. Attempted upward or downward movement induces movements similar to those excited in the right eye.

When told to look to his left, he moves his left eye outwards, and at the same time moves the right eye outwards, *i. e.* he uses both external recti simultaneously. This was repeatedly tried, and always with the same result.

There is almost constant nystagmus of this eye, as of the right, but the nystagmic movements are neither synchronous with, nor of the same kind as those of, the right eye.

When reading, patient holds his book to the right of the median line, and uses his divergent right eye ; if the right eye be covered, he can use his left eye, though to do so he has to move his book towards his left hand.

V. R. $\frac{6}{18}$ – ·25 D. $\frac{6}{12}$; 2 J. at p. 5″.
L. $\frac{6}{18}$ – ·5 D. $\frac{6}{12}$; 2 J. at p. 5″.

Pupils equal, 7 mm. in moderate light; oscillating but not rhythmically so ; action with efforts at accommodation is fair, that to light rather better. Colour-vision normal. Fields nearly if not quite normal.

Ophthalmoscopic examination.—Fundus and media normal in each eye. There is no diplopia, nor has there ever been such.

Facial muscles well developed, and act normally. No paralysis of sensory nerves.

The only treatment adopted was removal of an elliptical piece of skin from the upper lids, and the shortening of the lids resulting therefrom has enabled the patient to pursue his vocation with much more comfort.

Case 3.—Elizabeth A—, æt. 13. A well-grown, healthy-looking girl. She has almost complete ptosis on both sides, but the lids are slightly more open than those of her brother, whose case I have just narrated. The

movements of the eyeballs are defective in a very similar manner to those of the other members of this group.

Right eye.—Complete loss of upward movement. There is a fair amount of outward and inward rotation, and a very slight degree of downward movement.

Left eye.—Upward and downward movement completely lost; inward movement moderate, about the same in degree as that of the right eye. There is no outward movement beyond the midline, the eye stopping quite abruptly on reaching this, when allowed to return from inward rotation to the position of rest. Altogether the movements of this eye are more limited than those of the right.

Convergence for near objects is very fairly accomplished.

V. R. $\frac{6}{12}$ partly, 1 J. at 6″. No improvement by
L. $\frac{6}{12}$ partly, 1 J. at 6″. glasses.

Case 4.—Minnie A—, æt. 6. A healthy-looking, well-nourished child, of average height.

Ocular muscles.—There is complete bilateral ptosis, and no action of the levatores palpebrarum can be elicited. By the aid of the occipito-frontalis the palpebral fissures can be opened to the extent of 7 mm. at the widest part. She carries her head slightly thrown back, and peeps out from beneath the drooping lids.

The condition in the two eyes is similar. There is total loss of upward movement, and when this is attempted slight convergence occurs. Downward movement is also lost, and any attempt to look down calls the internal recti into action.

Neither eye can be moved outwards, nor can the patient use either internal rectus when she wants to look to the right or left, *i. e.* there appears to be inability to use the right internal and left external recti (or the reverse) in conjunction. There is, however, a moderate amount of convergence power, though this is very defective, and the usual position of the eyes appears to be one

of slight convergence. She generally uses the left eye for reading, and if this be covered changes the position of the book towards her right, and uses the right eye.

There is constant slight irregular nystagmus, the movement being generally obliquely downwards and inwards in each eye; occasionally slight rotation of the vertical axis inwards.

The pupils are unequal, left 6·5 mm., right 5·5 mm., their action to light and accommodation fair, but they are very oscillatory. Her sight is believed to be good, though it is very difficult to test this. The child attends school, and has learned to read a little.

Ophthalmoscopic examination.—Media clear. O. D and retina healthy in each eye. Refraction, H. about 2 D.

There is no other congenital defect, and the patient has always had good health.

In the 'Klinische Monatsblätter für Augenheilkunde,' for July, 1879, is an exhaustive paper by Dr. G. Heuck, of Heidelberg, on this subject, founded on four cases in one family which had been under his care. His article is enriched by the record of a post-mortem examination of one of his patients who died of "scarlet fever and diphtheria." Heuck's cases included a mother and three of her children, and, in view of the autopsy he obtained, are so valuable that I shall give some details of them. My cases bear a striking resemblance to his.

Case 1.—G. S—, æt. 53, the mother of Cases 2, 3, and 4. Complete ptosis, bilateral. Both eyes constantly directed downwards, so that the optic axes are 32° below the horizontal. No upward, downward, or outward movement of either eye. A moderate amount of convergence power. Attempted movement to right or left resulted in both eyes being moved inwards slightly, and this movement was attended by a small amount of rotation.

V., R. and L., $\frac{6}{60}$ and 4 J. Binocular vision good to 4″ p. p.

Fields of vision showed only an upward defect from the malposition of the globes.

Ophthalmoscopic examination revealed no fundus changes.

Case 2.—William S—, æt. 18, exhibited very similar defects, but of unequal degree in the two eyes. There was complete double ptosis and loss of upward and downward movement of the eyeballs. The internal and external recti acted, though very deficiently, and the movement induced by the former was attended by slight rotation.

V. R. $\frac{6}{36}$, 1 J.
L. $\frac{6}{18}$, 3 J. Accommodative power good.

Case 3.—Joseph S—, æt. 16. Double ptosis, slight convergence and depression of optic axes. No upward or downward movement, but when these were attempted there was slight rotation, such as would result from the action of the superior and inferior obliques. Lateral movements could be effected, but were deficient in extent. They were unaccompanied by rotation of the globes, such as occurred in the two previous cases.

V., R. and L., = $\frac{6}{36}$ and 2 J. Binocular vision good to 3″. No other defects.

Case 4.—Angelica S—, æt. 12. The condition in this patient was very similar to that of Case 3. Complete bilateral ptosis, depression of optic axes, no movement of eyeballs upwards or downwards, but some rotation in attempting these movements. Lateral movements very defective, but unaccompanied by rotation of the eyeballs.

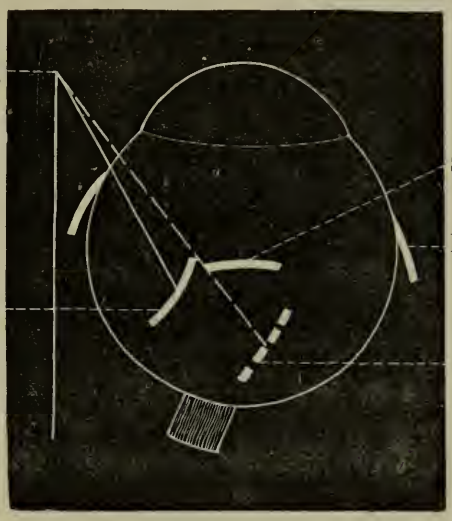
V. R. $\frac{6}{24}$, 3 J., 9″ to 5″.
L. $\frac{6}{39}$, 3 J., 6″ to 4″. Binocular vision good to 3″.

Case 2.—William S— died of "scarlet fever and diphtheria," and an examination of the contents of orbit was made, with the following results:

On the right side there was a very delicate ill-developed

levator palpebræ 2 mm. broad. On the left side no trace of the muscle could be detected.

As regards the muscles attached to the eyeballs they were all, with the exception of the two internal recti, inserted into the sclerotic in abnormal positions. The superior, inferior, and external recti were inserted too far



Right eye.

back, the displacement of some of them being as much as 2·5 mm. The superior oblique muscle in each eye, instead of its usual position to the outer side of and posterior to the insertion of the superior rectus, was inserted to the inner (nasal) side of the superior rectus, and reached a short distance anterior to it. The inferior oblique muscles were nearly normal in their insertion.

In addition to this displacement there was considerable alteration in the length of most of the muscles. Nearly all were too short, the difference being as much as 10 and 11 mm. in the case of the inferior recti. The superior recti were very thin and almost membranous, but the other muscles appeared well developed and of about normal size.

The orbital nerves appeared in all respects normal.

Briefly, the following deviations from normal were present :

(1) A backward insertion of the superior, external, and inferior recti.

(2) A forward and internal attachment of the superior oblique muscles.

(3) A remarkable shortening of the inferior recti, and, to a less degree, of the internal recti.

(4) An exceedingly imperfect development of the levatores palpebrarum, and an ill-developed condition of the superior recti.

Heuck proceeds to explain the symptoms observed during life by the conditions found after death, as follows :

" The ptosis was easily accounted for ; the complete loss of upward and downward movement of the eyeballs less easily, as the superior and inferior muscles were present. The small size and backward insertion of the former, and the fact that owing to the ptosis they could never have been exercised, will account for the lack of upward movement, and the contraction of the strong inferior recti would also have to be considered.

" The defect in outward movement resulted from the backward insertion of the external recti and the malposition of the insertion of the superior obliques. The internal recti were inserted in the normal position, but were slightly too short ; they were the only muscles whose action in life approached that of normal muscles."

Dr. Schenkel, of Prague,* reports a case of " Congenital defect of development of the levator palpebræ superioris, rectus externus, rectus internus, rectus superior and obliquus inferior of both eyes." Schenkel's patient was a male, aged twenty-six, whose parents and eight brothers and sisters were free from any defect. The patient himself presented no other developmental anomalies. The only ocular muscles which could be induced to act were the superior obliques and inferior recti. V. $= \frac{6}{9}$, and 1 J. No ophthalmoscopic changes.

* Hirschberg's ' Centralblatt,' 1881, p. 335.

These cases of Heuck and Schenkel are the only ones I have found which are on all fours with my own, but there are reports of a number of cases of congenital defect of one or two of the ocular muscles, which may here be alluded to.

Steinheim* records the case of a lad aged fourteen with complete bilateral ptosis, depression of the eyes downwards, with loss of upward and defect of lateral movements. On attempting to advance the superior rectus of one eye this muscle could not be found.

Baumgarten† gives the case of a young man with congenital convergent strabismus of both eyes. An attempt to divide the right internal rectus proved that only a few membranous strands occupied its place, and these were attached to the eye very far back.

Hirschberg‡ mentions the case of a child one and a half years old, who had congenital ptosis (bilateral) with defective upward movement of the eyes, and very marked epicanthus.

Cazeaux,§ in the examination of the body of an unknown man, found that both superior oblique muscles were absent.

Olbers‖ mentions the case of a man who during life had both eyes strongly turned to the right, and was unable to move them to the left. On post-mortem examination the right internal rectus was absent, and the left external rectus was found to be very ill developed.

Diffenbach,¶ in several cases of congenital strabismus, found the muscles at fault were attached to the globe considerably further than their normal distance from the edge of the cornea.

There are some recorded cases in which congenital

* Zehender's 'Klin. Monatsbl.,' 1877, p. 99.

† v. Ammon's 'Monatsschrift,' Bd. iii, p. 496.

‡ 'Klin. Beobachtungen,' 1874.

§ 'Bull. de la Soc. Anat. de Paris,' 1833, Nos. 10 and 11.

‖ 'Dissertatio de oculi mutationibus internis,' Göttingen, 1781.

¶ 'Das Schielen und seine Behandlung,' Berlin, p. 33.

defect of ocular movements has been due to absence or imperfect development of the nerve supply, the muscles being apparently normal in size and structure, but such cases are rare, and in all that I have been able to refer to there have been other gross defects of the nervous system. Thus Seiler* mentions three cases. In one, the subject of hydrocephalus and microphthalmos, the ciliary ganglion and its branches of distribution on the right side, and all the nerves to ocular muscles on the left side except the sixth, were wanting.

In another case, also one of hydrocephalus, on the right side all the oculo-motor nerves, and on the left side the third nerve, the fourth nerve, and the first division of the fifth nerve were absent.

In the third case, with the exception of the second pair, there were no nerves in the orbits.

Cornaz† refers to a case of Cerutti's in which the third, sixth, and first division of the fifth nerves consisted solely of fibrous sheaths. This patient was hydrocephalic and microphthalmic.

It will thus be seen that, so far as published records go, these congenital defects are almost always due to developmental anomalies affecting the ocular muscles, and that, except in cases in which there is gross defect in the nervous system, the nerves supplying these muscles are not at fault, or at least that they are of normal size and distribution.

This is the opinion expressed in all our standard text-books, in fact, but few authors mention the possibility of absence or incomplete development of these nerves.

In instances where the abnormality is less general than in the cases I have brought forward this evening the levatores palpebrarum of all the orbital muscles are most often the subject of this defect. Cases of congenital ptosis are common enough. Of the ocular muscles proper the internal recti are the most frequent sufferers.

* Seiler, 'Beobacht. ursprunglicher Bildungsfehler der Augen.'

† 'Des Abnormités congenitales des yeux et de leurs annexes,' 1848.

No explanation, so far as I am aware, has been offered to account for this very curious anomaly, nor is it easy to suggest one. I shall be very glad if any member of the Society will express an opinion on this point. Had there been in any of the reported cases great abnormality in shape or size of the globes, a malposition of the attachments of the recti and obliqui might be to a certain extent explicable, but in every instance the eyeballs have deviated very slightly from normal; a low degree of hypermetropia has been present in some of them, but nothing more than this. The internal ocular muscles have also given no evidence of want of development or power. Visual acuity has always been good, though seldom quite up to the standard, even with any error of refraction corrected.

It is noteworthy that in no case was diplopia a symptom, though there was often a want of parallelism in the optic axes, even when the eyes were at rest, and to a much greater degree when certain movements of the eyeballs were made. Operative treatment in two recorded instances produced troublesome double vision.

It is certainly somewhat remarkable that the subjects of these anomalies have been quite free from any of the more usual congenital developmental defects, as harelip, cleft palate, colobomata of irides or choroids, &c.

In the very few cases in which post-mortem examination has been procurable, two kinds of defect have been found:

(1) Complete absence of the muscle or muscles in question.

(2) The muscles present, but ill developed, of insufficient length, and attached to the eyeballs in abnormal positions.

When the latter obtains, this mal-insertion, in the case of the recti muscles, has invariably been too far back, as though they had failed to reach their proper position on the sclerotic. In Heuck's fatal case, as mentioned above, the superior oblique tendon was attached to the sclera on the nasal side of the median line, *i. e.* it had failed to

reach its normal site of attachment. I am not well enough informed about the development of the ocular muscles to know if this falling short can be a direct result of the absolute want of length which these muscles presented.

The abnormality, both in length and site of insertion, which the ocular muscles may present in these cases, renders it almost impossible to give any reasonable explanation of the curious movements noticed in some of them, such as the rotation of the eye, which occurs in my Case 2, when presumably the lateral recti muscles should alone be acting.

(*December 8th,* 1887.)

Mr. Silcock remarked, as bearing out the observations made by the President, that he had a young man about twenty years of age under his care at the Moorfields Hospital, who exhibited partial ptosis, with paresis of the external ocular muscles supplied by the third nerve on one side, and slight hypermetropia, the other eye being emmetropic, and in all other respects normal. The mother of the patient averred that the movements of both eyes were alike in early childhood, and that the condition now present was traceable to an illness occurring then, which had during the many subsequent years remained practically unchanged. Such cases as that narrated were no doubt analogous to that type of disease known as infantile paralysis.

Mr. Robert W. Doyne considered that Mr. Power's remarks were in perfect accord with Weismann's theory; the metaplasm, by some failure of nutrition, might reproduce partially a species of less high development than that now represented by man, who has arrived at the present state by the process of natural selection and survival of the fittest. In this way the condition might be looked upon as a partial reversion to a primitive condition.

2. *Case of irideremia.*

By Gustavus Hartridge.

John W—, æt. 18, a tall, well-grown young man, an inmate of Dr. Barnardo's Home, came to me at the Royal Westminster Ophthalmic Hospital, suffering from slight catarrhal conjunctivitis, which quickly got well under treatment.

He gave the following family history. Father alive and well, age about forty-six, sees well. Mother died a few years ago at the age of forty from the result of burns received at a fire; her sight was good. Had one brother who died at the age of nineteen from hip disease; his sight also was good. No relative, as far as he knows, ever suffered from defective vision.

The patient said he had always seen badly, and had constant movement of the eyeballs; he had never heard any reason given for these defects. He could distinguish distant objects better than near ones; had never had any inflammation in the eyes beyond the present catarrhal attack.

Present condition.—Well-marked rotatory nystagmus, which is increased on fixation; movements of the eyeballs normal in every direction.

R. V. $\frac{3}{60}$ not improved; 19 J.; tension full.

L. V. fingers at 2 metres; T. + 1.

Right eye.—The external conformation of the eye appears normal, the cornea is slightly irregular, and has two or three small nebulæ near its margin; it measures 11 mm. in the transverse and 10 mm. in the vertical meridian. Iris is completely absent, and the lens has a slightly opalescent look, denser in parts so as to form distinct opacities. On looking at the eye with a mirror, the lens, which is not quite clear, appears dislocated

slightly upwards. No ciliary processes are visible; the vitreous contains a few large floating bodies. The disc, which is difficult to see, partly on account of the lenticular and vitreous opacities, and partly on account of the nystagmus, is somewhat irregular in shape, and has a deep physiological cup.

Left eye. — External conformation normal, cornea slightly irregular but clear, measuring 11 mm. in the transverse and 10 mm. in the vertical meridian. Iris absent. Lens densely opaque and dislocated upwards, so that its lower margin is opposite the middle of the cornea, while its upper part is hidden behind the sclerotic; it moves about slightly with every movement of the eye. With the mirror numerous vitreous opacities are to be seen; details of fundus not visible.

(*Card specimen. January 26th,* 1888.)

Mr. Priestley Smith, in commenting upon the case, thought the right lens might be malformed and not dislocated; he also suggested that the increase of tension might be due to imperfect development of the anterior lymphatic system of the eyes.

XIII. INJURIES AND OPERATIONS.

1. *Punctured wound of upper eyelid, followed by complete palsy of third nerve and optic nerve atrophy.*

By W. A. Garrard,
SURGEON TO THE ROTHERHAM HOSPITAL.

(Communicated by Simeon Snell.)

Frederick S—, æt. 7, was playing on April 19th, 1887, when he fell, holding in his hand a piece of stick, which pierced the left upper eyelid just above the margin. He says the piece stuck in, and that another boy pulled it out, but he seems to think it did not pierce very deeply.

The patient was brought the next day to the Rotherham Hospital, and it was thought then that the upper eyelid, which was swollen, only had been injured; the eyeball appeared intact. The next day the house surgeon (Mr. Cropley) noted that there was a small jagged wound just above the upper margin of the left upper eyelid, and that the eye was closed. When seen two days later the eyelid was still drooping, although any inflammatory exudation or blood occasioned by the small wound had become absorbed.

On lifting the eyelid it was noticed that the pupil was dilated and did not react to light, also that the eyeball could be moved only in one direction, viz. downward and outwards. Evidently there was complete paralysis of third nerve. The optic disc appeared normal.

On May 6th he was made an in-patient, all the previous named conditions of paralysis remaining.

9th.—Patient was seen to-day by Mr. Snell. He corroborated the diagnosis of complete paralysis of the third nerve. There was no evidence of the stick having deeply penetrated into the orbit. He thought the disc was a little paler on the affected side. The pupil did not act to light; accommodation was paralysed, patient being unable to see letters closer than about eighteen inches; distant vision seemed fairly good. He was unable to elevate the upper eyelid sufficiently to open in the slightest degree the palpebral fissure.

12th.—The patient is able to open the palpebral fissure about one twelfth of an inch; the other conditions remain.

14th.—He can raise the eyelid sufficiently to open the palpebral fissure a quarter of an inch; he can also turn the eyeball inwards, by an effort, so as to bring the pupil in the centre of the fissure.

15th.—Further improvement in raising the eyelid and in drawing the eyeball inwards. No appreciable movement upwards or downwards. The pupil is still insensitive to light or accommodation, and is still dilated.

20th.—Can now elevate the left eyelid to nearly the same extent as the right, a slight drooping only being noticed. Pupil is still dilated; movements of eyeball the same.

June 5th.—The patient can now fully elevate the upper eyelid; cannot completely follow with the left eye the movements inwards, upwards, or downwards. The pupil is not quite so fully dilated as at first. It acts very slightly to light, but much more appreciably to accommodation.

30th.—Has now complete control over muscles of upper eyelid and eyeball. Pupil dilated more than right, but acts to light and accommodation.

November 3rd.—Mr. Snell saw the boy with Mr. Garrard to-day. The palsy of third nerve had passed away, the ocular movements were good; there was no ptosis; the pupil was about the same size as that of other eye, it acted imperfectly, if at all, to light. The optic

disc was distinctly white; the retinal vessels were not, however, lessened in size. Vision was very imperfect; it was doubtful whether it was much more than light perception, or the observing of some large object.

At no time was there any paralysis of any other muscles of the orbit beyond those supplied by the third nerve. Fourth and sixth were unaffected, and so indeed was the ophthalmic division of the fifth.

Remarks by S. Snell.—The case just related is a very interesting one. We are accustomed to witness various results following a blow on the eye. It must be very rare, however, that such an association of symptoms occurs as is the case in the instance now related. A short time since I had under my care a young man aged eighteen, who some days before his admission into the Sheffield General Infirmary had sustained a blow over the right eye with a fist. Swelling soon took place, which prevented his opening the eye. In about five days, however, when the swelling had subsided, and he could separate the eyelids, things seemed "double" to him. This arose from incomplete paralysis of the internal rectus. Recovery gradually occurred. A middle-aged man is at present under observation. Shortly before Christmas he was hit by a pair of tongs on the right lower eyelid, tearing it, and occasioning a good deal of swelling around, and protrusion of, the eyeball. This was thought to be due in great measure to hæmorrhage. The swelling disappeared, but ptosis remained, and is now, at the end of eleven weeks, only slowly passing away. In neither of these cases was the optic nerve affected.

But how are we to explain the train of symptoms in the case related? There is no evidence of the piece of stick having penetrated deeply into the orbit. Mr. Cropley, the house surgeon, who saw the child soon after the accident, is convinced that it did not do so. Direct injury, therefore, to the parts at the back of the orbit can hardly be entertained.

In the 'Ophthalmic Review' for 1884, p. 73, I recorded

a case of a labourer in which a pick had passed through the upper eyelid and entered the orbit between the superior and inferior recti. Atrophy of the optic nerve resulted, and there was paralysis of the external rectus, which, however, gradually recovered.

Leber has explained the cases of monocular amaurosis following blows about the supra-orbital region as due, not to any interference with the fifth nerve, but caused by fracture in the vicinity of the optic foramen. Holder has moreover pointed out ('Ophthalmic Review,' 1881, p. 34) that in 60 per cent. of cases of fracture of the base of the skull, at post-mortem examination, fracture of the wall of the optic foramen occurred. Dr. Hill Griffith has kindly directed my attention to two cases of optic nerve atrophy, following blows on the eye, recorded by him in the 'Medical Chronicle' for 1885, p. 382, which lend support, he thinks, to Leber's opinion. Berlin points out that as early as 1845 Nuhn sought an explanation in an injury or rent of the optic nerve within the optic foramen.

Simple atrophy following blows is more often met with, and it appears quite reasonable to assume that Leber's explanation is applicable to many of the cases to which he refers of injuries about the supra-orbital region, and even of the head itself. The case related is of a different character, and it is not easy to suppose that the blow on the eyeball was sufficiently great to push it back so as to fracture the optic foramen. Such a force would, one would think, have almost necessitated some changes in the eye, if not evident externally, visible internally with the ophthalmoscope, as hæmorrhages or rupture. Nothing of the sort was present in this case. Short, however, of such an amount of force, it is likely that sufficient was exerted to have driven the eyeball back into the orbit, and in this way to compress or jar the optic nerve, or to tear it or the sheath. Allowing that either of these hypotheses would explain the atrophy of the optic nerve, it is still difficult to say why the selection of the third nerve was made, and the other so completely escaped

injury. It is interesting to note that at first the appearance of the optic papilla was normal, and that "whitening" did not show itself until the lapse of about three weeks after the accident. This accords with Leber's opinion that the injury to the optic nerve would be far back about the optic foramen, and the delay in the appearance of changes in the papilla arises from the degenerative changes having to travel downwards. One thing of importance with respect to the third nerve palsy, besides its completeness, is that it appeared almost directly. The thorough disappearance of the affection, taken with its rapid onset, would seem rather to point to extravasation around the trunk, or at its bifurcation. All parts of the nerve were equally affected.

(*March 8th*, 1888.)

Mr. Hulke thought the evidence adduced by Mr. Snell insufficient to disprove the possibility that the wound in the lid had not also penetrated deeply into the orbit, and mentioned cases of apparently very trivial wounds, with supervention later of symptoms ending in death, where, at post-mortem examination, foreign bodies were discovered in orbit and wound.

Mr. Nettleship thought that the stick had in all probability penetrated to the apex of the orbit and damaged the optic and third nerves directly, since no other intelligible explanation seemed forthcoming, and it was well known that the statements made by patients about the depth of small penetrating wounds of the orbit were often totally misleading. He thought it of considerable interest that the third nerve should have recovered whilst the optic nerve, following what, in his experience of injuries to this nerve had been the rule, had not recovered at all. He agreed with the statement that in cases of injury to the optic nerve diagnosed as far back in the orbit, or in the optic canal, atrophic appearances became visible at the disc from two to four weeks after the accident.

Mr. Edgar Browne said it was sometimes extremely

difficult to prove a negative in cases of this kind, and wounds may be so situate as to escape observation. He remembered a case of a child, brought for an ecchymosis of the inner conjunctiva exactly resembling such as is frequently seen after coughing fits, or operation for strabismus. The case had been treated by astringents. Almost by accident, a recent scar, coinciding with the fold of the skin of the lower lid at inner angle, was noticed, and on pressure a hard substance was felt beneath the lid. Under chloroform an exploratory incision was made, and a piece of tobacco-pipe stem, with some difficulty was extracted. It had been tightly wedged in the inner and lower angle of the orbit, and judging from measurements made on skulls of about the same size, was of the greatest dimensions that could be included in the orbit. No suspicion of its presence existed in the minds of the parents, but they remembered that the child had been playing with a "churchwarden," and had fallen and smashed the pipe, but it was supposed that all the bits had fallen on the floor, and they did not connect the occurrence with the ecchymosis which had appeared shortly afterwards.

Mr. Adams Frost remembered a case, which he had seen at Moorfields, which resembled that mentioned by Mr. Edgar Browne, in which the broad vulcanite mouthpiece of a pipe had lain unsuspected in the orbit for three days. The eye was blind, and the appearance of the disc normal, but it subsequently became atrophic. This case had been seen by a surgeon, and the well-known hat-peg case, in which the foreign body remained in the orbit eight days, was seen daily by a surgeon.

Mr. Snell, in reply, said he was quite familiar with the kind of cases alluded to of foreign bodies having deeply penetrated the orbit. He had seen such instances in his own practice. In the case related, he had, however, carefully gone into that question, and he did not find evidence sufficient to support such a contention. Moreover, the child was seen by a good observer very soon after the injury, and he was of opinion that the stick did not pene-

trate deeply. The situation of the wound on the eyelid rather suggested the direction, as the eyeball had escaped injury, that the eyelid would have been carried upwards toward the wall of the orbit above. Viewed altogether the case was not easy of explanation. No doubt direct injury would readily account for the optic nerve atrophy, but no suggestion had been offered to explain the occurrence also of the complete palsy of the third nerve. If it were supposed that that nerve also was implicated by direct injury, and not in the manner suggested in the paper, the completeness of the affection must be borne in mind, as well as the anatomical relations of the nerves at the back of the orbit. The stick would then not only have avoided the other orbital nerves, sensory and motor, but have affected the third nerve in such a manner as to produce palsy of all its branches, and it must be recollected that on entering the orbit at the sphenoidal fissure, the nerve had already bifurcated into two primary branches, and that the undivided trunk coursed along the outer wall of the cavernous sinus. The completeness of the recovery of this nerve was also more in accordance with effusion than direct injury.

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2. *An unusual complication after subconjunctival tenotomy of the internal rectus.*

By A. Emrys-Jones, M.D. (Manchester).

Ada H—, æt. 10, first attended as an out-patient under my care at the Royal Eye Hopital, Manchester, on July 20th, 1887.

She had a well-marked alternating convergent strabismus of three lines with normal vision in both eyes.

At the same date, after she was put fully under the influence of ether, I divided the *right* internal rectus

without any trouble, but immediately after dividing the *left* internal (and there was no trouble experienced in doing this) there was profuse hæmorrhage into Tenon's capsule, which gave rise to well-marked proptosis.

Counter-punctures in the conjunctiva had no effect in lessening the protrusion, and so a roller-bandage was firmly applied, and the child was kept quietly in the recumbent posture.

Two hours later, on removing the bandage, the proptosis was more marked, the pupil widely dilated and inactive, and perception of light very doubtful.

On ophthalmoscopic examination I found the optic nerve quite blanched, and no blood seemed to pass through the blood-vessels.

She was then admitted as an in-patient, and in two hours again examined, and to my intense gratification I found the vision rapidly returning, the optic nerve of good colour, distinct arterial pulsation and less proptosis. Next day vision $\frac{6}{9}$, proptosis less.

She improved daily, and on the 29th, *i. e.* nine days after the occurrence, she left the hospital with normal vision, no proptosis, and the eyes quite straight.

The temporary loss of sight, and the appearances enumerated, were doubtless due to the stretching of the optic nerve from the pressure of the column of blood.

At the time I feared embolism or rather thrombosis of the central artery, and this might easily have occurred.

I have not been able to find a record of a similar case. It is quite possible that the same complication might have taken place, but that vision had been re-established before an examination had been made.

(*December 8th*, 1887.)

Mr. Lawford mentioned a case he had seen while house surgeon at Moorfields. A myope, aged twenty, was operated on by the late Mr. Streatfeild for convergent strabismus. Division of the right internal rectus was followed by severe hæmorrhage into the orbit, the eyeball

became proptosed, and the lids very tense and dusky in colour. The patient was put to bed, and an iced compress applied, and the symptoms gradually disappeared. Five days later, when lifting a heavy coal-scuttle, hæmorrhage suddenly recurred, attended with the same symptoms, but much more severely. The proptosis and tenseness of lids and surrounding tissues were very marked, there was great pain and vomiting and faintness. Iced compress to the eye, morphia hypodermically, absolute rest, were ordered, and the symptoms all gradually subsided. There were no subsequent changes in the optic nerve.

Mr. Adams Frost had seen great proptosis and swelling of the eyelids come on in a young child immediately he divided the tendon of the internal rectus; the swelling and proptosis subsided in a few days. The vision was not tested.

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3. *Persistent hæmorrhage in the anterior chamber after iridectomy for chronic glaucoma.*

By A. Emrys-Jones, M.D. (Manchester).

On October 17th, 1882, Mr. Samuel A—, æt. 63, of Wilmslow, consulted me privately on account of gradually failing vision. He said he frequently changed his glasses; had seen halos round the light, &c.

In the right eye there was only faint perception of light, T. + 1. In the left eye vision $\frac{6}{18}$. Field much contracted all round, T. + 1, and, as far as I could ascertain, cupping of optic nerve.

On October 24th an iridectomy upwards was performed in both eyes, and large pieces of iris excised. The operation was followed by very free hæmorrhage.

On the 25th, *i. e.* next day, I found the anterior

chamber very full of blood, and no trace of iris could be detected anywhere.

In the next fortnight there was scarcely any improvement. I could detect the margin of the iris at certain spots.

On November 24th, *i. e.* a month after the operation, the hæmorrhage had subsided considerably; the outlines of the pupil could be now detected.

The improvement was excessively slow, and it was not until December 16th, *i. e.* nearly two months after the operation, that the pupil was sufficiently clear to enable me to make an ophthalmoscopic examination, when I found the vitreous clear and a much deeper cupping of the optic nerve than I had anticipated.

His vision at this date was the same as before the operation.

Mr. A— suffered from hypertrophy of both ventricles and from troublesome dyspnœa. He went to Southport for a change of air, and took a severe chill and died on January 17th, 1883, from cardiac disease complicated with double pneumonia.

It is the recollection of my anxiety during the weary waiting for the absorption of the hæmorrhage that induces me to record this case.

I searched in vain in the text-books and the various reports for guidance and light as to what would be the ultimate result. I asked a number of ophthalmic friends, but could get no consolation; several suggested that there must be deep-seated hæmorrhage, and that the prognosis was very gloomy.

The nearest approach to help I obtained was from Dr. Haynes Walton's book, where, in speaking of injuries to the eye from mechanical causes, he says: "The removal of the blood (from the A. C.) *may* or *may not* be rapid; in twenty-four hours a small quantity has disappeared, yet weeks may be required for the accomplishment of the same process if coagulation ensue. There is very marked difference in the time required for absorp-

tion, when the blood is effused into chambers occupied by serum, the consequence of pre-existing disease. A clot has remained during six months under these circumstances before it lost its shape or characteristic hue, and it was undergoing very slow absorption at the end of twelve months."

It is of course common enough to find a certain amount of hyphæma remaining unchanged for an almost indefinite time, but I have not met in my experience with any case where the whole anterior chamber was filled with blood for such a long period without absorption.

I feel that the 'Transactions' of a Society like ours should contain a record of such cases as this for the guidance of its members when similar complications occur.

(*December 8th*, 1887.)

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4. *A note on the operations for staphyloma of the cornea.*

By J. Tatham Thompson (Cardiff).

Having found, in operating for staphyloma of the cornea, by the removal of an elliptical portion, the difficulty of obtaining a firm grip of the staphylomatous portion by any catch or other forceps, and even when this has been attained, the difficulty of removing quickly and cleanly the desired amount, I was led to adopt the following procedure, which I have found of considerable advantage.

The projecting cornea is transfixed at its base by a small bent needle threaded with a fine horse-hair, the needle withdrawn, leaving the horse-hair passing through the most prominent part. The two ends are then seized between the fingers and thumb of the one hand and twisted so as to be as little in the way as possible. Then, with a Graefe's knife an elliptical portion is rapidly excised

with two cuts of the knife, the size of the ellipse varying with the amount of the projection, and the ends of the incisions falling beyond the points of entrance and exit of the horse-hair. The portion thus cut away is removed still in the bight of the horse-hair. The edges of the wound are found to adapt themselves readily. The parts are well flushed with a weak solution of perchloride of mercury, and a tolerably firm pressure applied to keep them in apposition.

I have found that union as a rule has been complete in from four to five days, and in the six cases in which this procedure has been adopted very good results have been obtained.

No pressure is put upon the contents of the eye during the excision, and so there is less risk of escape of the lens, and prolapse of the iris or vitreous. The amount of cornea removed can be gauged with tolerable certainty.

In cases of partial staphyloma, where there is constant ulceration from the friction of the lids and from exposure, the removal of the projection affords greatly increased comfort, and gives a better chance of improved vision where an iridectomy is performed for the formation of an artificial pupil.

In one of the cases operated on there was, five months afterwards, a slight return of the staphyloma. This was punctured, and the eye kept bandaged for a few days, and when last seen the patient was doing well.

(*May 3rd*, 1888.)

5. *Conical cornea treated by cauterisation.*

By Charles Higgens.

Harriet B—, æt. 22. Conical cornea, both eyes. Vision, R. eye, 2 J. at 4″, L. eye, 14 J. at 4″.

October 21st, 1887.—L. eye, apex of cone seared all over superficially and small central perforation made with galvanic cautery. Three weeks later the wound had healed, and the pupil was circular.

November 11th.—R. eye operated on in same manner. The wound did not heal for nearly a month, and an anterior synechia formed.

January 24th, 1888.—Both eyes central opacity, iris adherent in R.

Vision, R. 1 J. at 6″, L. 1 J. at 4″.

(*Card specimen. January 26th*, 1888.)

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6. *Perforating wound of the cornea and iris, with a foreign body impacted in the retina.*

By Benjamin Wainewright, M.B.

George E—, æt. 40, came as an out-patient to the Royal Westminster Ophthalmic Hospital on December 7th, 1887. He had received an injury to the right eye five days previously, caused by a flake of hot metal from a furnace door.

The eye was considerably inflamed, and the vision reduced to counting fingers at six inches. There was a linear wound of the cornea radiating from near the sclero-corneal junction to the pupillary margin at the outer side and slightly below the transverse meridian.

The iris was likewise wounded to a corresponding extent, and entangled in the corneal wound.

A clot was visible in the posterior part of the anterior-chamber. The lens was uninjured, but there were a few linear marks on the anterior surface of the capsule, probably the remains of hæmorrhage. The vitreous was hazy, but the disc could be indistinctly seen.

There was a pyramidal mass of decolorised blood-clot capped with red, projecting from the lower part of the fundus nearly to the centre of the vitreous. In the median zone of the eye, above and slightly to the inner side, there was a large whitish patch of retinal effusion, in the centre of which a black body with a metallic sparkle and partly embedded was distinctly visible.

This body continued to be visible for several weeks, but gradually became covered with lymph, so that at the date of exhibition its position was only marked by a small nodule of lymph projecting from that part of the retina.

By the use of atropine, warm fomentations, and rest, the eye remained quiet, but the vision did not improve, and as the tension began to fall the eye was excised on February 4th, about two months after the accident, when a flake of iron about two lines square was found in the situation described completely encapsuled by lymph.

(*Ward specimen. January 26th*, 1888.)

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7. *Sclera containing silver artificial vitreous.*

By F. R. Cross.

Mules's operation done in February, 1887, for staphyloma and increasing buphthalmos without ulceration of cornea in a young woman aged twenty. This aseptic eye seemed favourable to rapid healing. There was the usual reaction for three or four days. On the thirteenth day

she left hospital. Glass eye worn in May till commencement of October, when conjunctiva became inflamed, resulting in abscess, which was lanced by Dr. Thompson, October 27th. In December the stump was irritable, but no fistula was detected.

She next came under observation (with the ball exposed about 5 mm., and marked black tingeing of the tissues surrounding the opening) a few days ago. The eye was removed yesterday. The sclerotic was thinned and contracted—especially at the opening. Its tissue was very vascular and the conjunctiva was closely adherent to it. The recti muscles were atrophied and shortened, and were inserted unduly near to the optic nerve.

(*Card specimen. May 3rd*, 1888.)

XIV. FUNCTIONAL AFFECTIONS.

1. *Functional eye symptoms in hysteria and allied conditions.*

By A. Hill Griffith, M.D. (Manchester).

I purpose giving an account of most of the cases that have come under my observation at the Royal Eye Hospital, and I have to thank my colleagues for their kind permission to make use of cases examined by me in their cliniques. My thanks are also due to my friend, Dr. Archibald Donald, of St. Mary's Hospital, Manchester, for examining and reporting on the condition of the uterus when thought necessary.

I shall notice only such cases that show some demonstrable affection of the central vision, field of vision, colour perception, or spasm of lids or recti muscles, and, as I do not find in the 'Transactions' any paper on the same subject, I venture to hope that my communication may prove of some interest.

The text-books devote only a relatively short space to the consideration of functional affections of vision, and make no distinction between the obviously hysterical cases and those which are indicative of neurasthenia. The symptoms, it is true, are all mentioned, but they are not grouped in the manner we find them in the majority of cases that come before us at a large eye clinique. My own experience leads me to state that those cases in which the symptoms are unilateral mostly comprise the hysterical patients, the neurasthenic patients having the symptoms of a bilateral character.

The following represents the groups into which I would venture to classify the cases I wish to speak of to-night, but only for the sake of convenience, for I do not imagine for a moment that the classification is a scientific one; indeed, as will be seen, the same patient may afford an example of separate groups at different times of her history.

(1) *Hysterical blindness.*

These cases occur at or before puberty in the female* sex; the blindness is usually complete and confined to one eye, but the pupil *always reacts* promptly to light when the sound eye is closed, and recovery is usually rapid. It is sometimes doubtful, as someone has remarked, if the subjects should be considered as patients or as culprits; in one case only, No. 4, I was able to produce diplopia by prisms, so that this was probably a case of feigned blindness. This patient was some time before under the care of Dr. Mules. The vision was then normal in one eye, and almost $\frac{6}{6}$ in the eye which eventually became blind, but there was marked peripheral contraction of both fields, so that she would then have been classed in Group 5. Strange to say, her brother, who came for advice at the same time, had also peripheral contraction of the fields, and, as in the case of his sister, complained of one eye being dim. This girl was seen by a distinguished hospital physician, who pronounced her to be suffering from cerebral tumour.

Schweigger (1) believes that blindness of one eye in hysterical patients is really a self deception; they are overruled by the idea they have lost their sight, so they cannot see!

Glascott (2) and Snell (3) each record a case of bilateral blindness with rapid recovery. There is no note of the mobility of the pupil, but they are both obviously hys-

* I have since this seen a case in a boy.

terical cases, and the same explanation will hold good for a good many of the apparently remarkable cases one sees recorded in the journals.

Case 1 (Dr. Little, vol. i, 53).—Clara B—, æt. 14.

R. shadows. L. fingers.

Pupils react separately to light, but are rather wide. Marked hyperæmia of discs, fundi otherwise normal. Sight has been affected for three weeks, and been almost gone, as at present, for a fortnight. Has been reading hard for school examination. Healthy-looking girl. Complained of headache. Menstruation commenced more than a year ago, but has not been properly established, she having been ill only two or three times. No treatment adopted. In one month V. $1\frac{6}{9}$ each eye, been failing for a fortnight, has sensation of stars and flashes of light. In six weeks V. $= 1\frac{6}{6}$ each eye. H. m. 1 D. Has not menstruated. Five years after I hear the sight has kept well all along.

Case 2 (Dr. Glascott, vol. iv, 94).—Mary R—, æt. 14, weaver.

R. no P. L.

L. + 1 D. Sph. $\bigcirc$ + 2 D. Cyl. $= \frac{6}{18}$.

R. pupil acts promptly to light when left is covered up. Fundi are normal. Field of L. eye slightly contracted. Colour perception normal. I could not produce diplopia with prisms. The R. eye went blind when at work three days ago. She has had slight convergence of R. eye, which has been present for years. Menstruation not yet appeared. In a fortnight condition exactly as before.

Case 3 (Dr. Little, vol. iv, 127).—Alice L—, æt. 8.

L. no P. L.

The pupil of L. eye is smaller than its fellow, but responds to light.

The retinal vessels, especially of unaffected eye, are tortuous to a very marked extent, fundi are otherwise normal. Mother says child has complained of a pain

shooting from the L. eye to the back of the head for several weeks, and on testing the eye ten days ago she found out the child was blind of the L. eye, and on questioning the child she said it had been blind for some days before this. There is no anæsthesia of left side of body. Mother says she is a very nervous child.

In ten months the L. pupil is 2 mm., and the R. pupil 4 mm. in diameter, but each responds separately to light. The L. eye had gained some considerable amount of sight. I tested her, but forgot to note it.

Case 4 (Dr. Hill Griffith, vol. iv, 141).—Ethel W—, æt. 20, single.

R. $\frac{6}{60} - 2{\cdot}5$ D. $= \frac{6}{6}$.

L. P. L. only, pupil reacts promptly.* Fundi normal. The L. eye has become affected since last four months. I bandaged up the affected eye and, holding a prism with the edge of the refracting angle, bisecting the pupil, she of course saw double. After uncovering the L. eye I repeated the examination with the prism placed in front of the unaffected eye, but in the usual manner, and she still saw double. I was thus quite able to demonstrate that the L. eye had good vision.

(2) *Amblyopia of one eye, with peripheral contraction of the field, achromatopsia, and hemianæsthesia.*

These are the cases described by Charcot and others as occurring quite commonly in hystero-epilepsy. I have notes of four cases, and I have seen several others, but one is very liable to pass them over, as the patients are always quite unconscious of the impairment of sensibility, and a supposed squint must often be made to do duty as the cause of the bad sight, as they appear to be almost unknown to ophthalmic surgeons.

Cases 6 and 8 had in addition blepharospasm, and the latter is a good example of traumatic hysteria in the

* I saw her after an interval of twelve months. V. $= \frac{6}{6}$ with $-$ 1 D. sph. Visual field and colour-perception normal.

male, a subject on which recent papers by Dreschfeld (4), and Collier (5), will be found in the 'Medical Chronicle,' and the latter comments on the frequency of spasm of the lids in this affection.

The symptoms in three of my cases were, as is usual, on the left side, but the fourth case is exceptional in two respects as occurring in a male and on the right side. In the classical cases occurring in the "hysteria major" of Charcot, the eye symptoms often persist for years, and in Case 5 I found the symptoms unchanged after two years.

Case 5 (Dr. Glascott, vol. ii, 349).—Ellen S—, æt. 8, school.

R. $\frac{6}{9}$ + 1·5 D. = $\frac{6}{9}$.

L. $\frac{6}{24}$ + 1·5 D. = $\frac{6}{24}$.

Fundi normal. No astigmatism. H. = 2 D. Complete achromatopsia in L. eye, and field of vision peripherally contracted. R. eye has normal field and colour perception. The entire left half of body is quite insensible to pain, but taste, smell, and hearing are normal.

Her aunt noticed, as she thought, a cast in the L. eye three weeks ago, and the child has not been able lately to thread her own needle; this latter symptom is perhaps due to loss of binocular vision. Her mother died of heart disease and consumption, and her father is a dissipated, suicidal epileptic. The patient is considered "a nervous little girl" by her aunt, with whom she lives. In thirty-two months I find the symptoms are unchanged.

Case 6 (Dr. Little, vol. ii, 288).—Ann W—, æt. 32, single, teacher.

R. $\frac{6}{9}$ + 1 D. = $\frac{6}{6}$. L. not fingers.

Fundi normal. Blepharospasm of L. eye. Pupils active. Field of R. eye normal, L. much contracted. Green is called blue at periphery of left field of vision. Complains of pain round left orbit.

Symptoms came on six months ago after some slight inflammation in the L. eye. When twenty-two she had complete prolapse of uterus; it got better without treatment. Menstruation always been regular. No syphilis. She has been under observation for three and a half years, the blepharospasm persists, the vision in the affected eye improved to $\frac{6}{36}$, and varied several times from this to fingers. Complete left-sided hemianæsthesia was made out, and has persisted for nearly one year. Dr. Donald examined her, and reported, "Anteflexion and some relaxation and prolapse of anterior wall of vagina."

Case 7 (Dr. Little, vol. ii, 374).—Mary T—, æt. 22, single, servant.

R. 1.
L. 1. at 7″; $\frac{6}{60} - 1$ D. $= \frac{6}{6}$ with R. eye and almost $\frac{6}{6}$ with L. eye.

Fundi normal, dilated, no error of refraction, showing slight spasm of accommodation. Charts of fields show equal peripheral contraction. Colour perception normal each eye. Complete insensibility to pain in left side of body, tactile sensation and muscular sense normal. Complains of L. eye being dim for a fortnight; she had a similar attack for a week about a month ago. (I only saw her once, and could not trace the case.)

Case 8 (Dr. Glascott, vol. iv, 209).—W. F—, æt. 27, carter, married, previously reported from my notes by Mr. Joseph Collier, 'Medical Chronicle,' April, 1888.

Patient strained himself while trying to raise his cart by pressing his shoulder against the wheel, and three weeks after he was found to have right hemiplegia. When seen at the Eye Hospital nine months after this we found the following condition of affairs: "He had to be led about by his wife, as he said he could not open his eyes, and was continually blinking the lids. It was therefore at first impossible to test the vision, but on covering the eyes with tinted glasses he was induced to open them for a little while.

"The fundi were normal, R. eye less than $\frac{6}{60}$, L. eye $\frac{6}{18}$.

It was a dark day, so L. eye = $\frac{6}{12}$ at least. The field of R. eye was contracted almost up to the fixing point all round (hand test only), and there was no colour perception in the R. eye. The L. eye had good colour perception, and the field was of normal size.

"There was complete analgesia of the right side of the body. The tendon-reflexes were exaggerated on both sides. There had been no sexual incapacity at any time since the accident."

(3) This group may be considered as consisting of the same class of cases as the preceding group, except that there is no anæsthesia. There was blepharospasm in three cases, and Case 12 is an example of traumatic hysteria in the male. I have tested Case 9 very frequently for impairment of sensibility, but this has never been present.

Case 9 (Dr. Little, vol. ii, 313).—Ellen P—, æt. 22, single, silk winder.

R. + 1 D. = $\frac{6}{12}$.

L. + 1 D. = $\frac{6}{9}$.

Fundi normal. Charts of fields show peripheral contraction for white, red, and green, but more marked in R. eye. There is blepharospasm of R. eye, and the lids are habitually kept partially closed, so that the L. eye by comparison looks quite staring. She is a fine tall girl with good teeth.

Menstruation commenced at age of thirteen, and has been quite regular till about two or three years ago; since then it has only been about every six weeks. The twitching of R. eyelids came on four months ago from getting some liniment into the eye, and for three weeks the sight of this eye has been dim. About six months after we first saw her she had an attack of rheumatic fever. In ten months the vision of R. eye had fallen to rather below $\frac{6}{60}$, but the colour perception was still unaffected, and there was no anæsthesia; still twitching of eyelids. In thirty-two months all these symptoms had disappeared,

the fields were normal, and she had given up the spectacles, which previously she wore, of her own accord.

Case 10 (Dr. Glascott, vol. iv, 21).—Lucy McC—, æt. 26, married.

R. $\frac{6}{6}$ almost.

L. $\frac{6}{6}$.

No error of refraction. Retinal veins seem full, fundi otherwise normal. Complained of R. eye for two weeks; the sight has become less, and she says the pupil is sometimes much larger than the other. Field of R. eye shows peripheral contraction (chart), and there is inability to distinguish green with this eye. The other eye has normal field and colour field. No anæsthesia. Married two years; no pregnancy. Menstruation has been rather frequent, every three weeks, for eighteen months. She suffers a good deal, and has leucorrhœa between periods. Sexual disinclination.

In ten months she said she felt her sight stronger. She has been laid up with rheumatic fever.

Case 11 (Dr. Little, vol. ii, 368).—Emma B—, æt. 17, box maker.

R. $\frac{6}{60}$ + 1 D. = $\frac{6}{18}$.

L. $\frac{6}{18}$ + ·75 D. = $\frac{6}{6}$.

Fundi normal. Peripheral contraction in right field for white, red, and green; field of L. eye normal. No anæsthesia. Blepharospasm of R. eyelids. Sight of R. eye always defective, but got worse last fortnight. Has neuralgic pains in head. In thirty months the blepharospasm has gone, but vision no better; dyschromatopsia in R. eye. Weeps for nothing, and is evidently hysterical.

Case 12 (Dr. Hill Griffith, vol. iii, 3).—Jas. T—, æt. 23, single, soldier.

R. 16.

L. 1 at 12″.

Pupils active. Fundi normal. Achromatopsia with R. eye. No anæsthesia. Keeps lids of R. eye nearly

closed, but there is no paralysis of lid or recti muscles. When on sentinel duty one cold night in a snowstorm about six weeks ago he got a blow on the R. eye, and the symptoms came on the next day.

Case 13 (Dr. Little, vol. iv, p. 17).—Margaret P—, æt. 30, married.

R. $\frac{6}{0}$, no glass = $\frac{6}{60}$.

L. 1 $\frac{6}{6}$, H. m. 1·5 D.

R. chart of field of vision normal for white and red. No anæsthesia. Colour field normal. Fundi normal. Direct reflex lost in R. pupil. Complains of R. eye being misty for four years, but worse since last confinement six months ago. Never squinted. Was here four years ago, the same eye being then rather dim, but it got all right. Has had eight children and one miscarriage two years ago, and since then has been subject to peculiar attacks, during which she cannot see to the right side, her face is drawn, and the right arm is numb. There is no heart disease; she never had rheumatic fever. In twenty-one months R. 6 $\frac{6}{18}$, fields, &c., normal. Pupillary reflex now present.*

She was examined by Dr. Donald, who found "old laceration of perinæum, erosion of cervix, chronic cervical catarrh."

(4) Here we have four cases in which blepharospasm was the only eye symptom. In the first case only is the spasm confined to one side. Cases 14 and 17 are examples of hysteria in the male, the former following a severe shake. Case 16 had been elsewhere treated actively for supposed meningitis, and Case 17 for epilepsy. As regards the cure of blepharospasm by pressure upon different points I am exceedingly sceptical that this is brought about by any direct inhibition through the agency of the fifth nerve. Holtz's case (6) of immediate cure by application of iodine is evidently purely hysterical.

* I now believe that this cannot be considered a functional case, and ought not to have been included in this paper.

Case 14 (Dr. Little, vol. ii, 230).—George J—, æt. 29, jockey.

Patient is very shaky, trembles all over, cannot stand light, and keeps his eyes nearly closed. Slight hyperæmia of bulbs.

About three weeks ago, when in a race, he was thrown from his mare and fell under her; he was unconscious only for a moment and remounted. Next day he felt ill, was much bruised, but the eye symptoms only came on the day before we saw him, and he "became blind." He wears a patch over the left eye as he says he has double vision.

In a few days he got quite well, and the fundi were then examined and found normal.

Case 15 (Dr. Glascott, vol. iv, 163).—Margaret H—, æt. 10 years and 3 months.

Kept left eyelids habitually closed (not paralytic) for nine months. Fundi normal. No loss of sensibility; did not test vision. Is a very nervous child, her mother says, but is quite composed and does not seem easily alarmed.

Case 16 (Dr. Glascott, vol. iv, 248).—Annie W—, æt. 22, single, servant.

R. and L. 1 $\frac{6}{6}$. She was wearing blue spectacles, and directly I took these off blepharospasm of both sides came on and continued till they were replaced. The fields, fundi, and colour perception were normal. The pupils were active. Six weeks ago she had a violent and well-marked hysterical attack, in which she cried a great deal, had intolerance of light, and complained of pain in the head, and after it was over she passed a large quantity of urine. The eye symptoms all date from this. There was no emotional or any known cause for the attack. Menstruation is regular. In the course of a few weeks I again saw her, and she was then perfectly well.

Case 17 (Dr. Hill Griffith, vol. iv, 243).—Fred D—, æt. 17.

R. and L. 1 $\frac{6}{6}$, no H. m. Wears tinted spectacles. Constant violent twitching of eyelids, which came on, it appears, three weeks ago, when at his work washing baskets, and without any cause such as an accident, blow, fall, &c., or any known emotional cause. It was necessary, we found, to place blue glasses before his eyes for the purpose of testing the vision, &c. The fundi and fields of vision are normal.

Directly the blue glasses are removed he has an hysterical attack, the lids twitch violently and rapidly, and the muscles of the face were also affected; then there was twitching of the right hand, which increased in severity, amounting to convulsions, and spreading over the trunk and upper extremities. His speech was only slightly affected; there was no anæsthesia or loss of consciousness.

I find from his mother that he has had "epileptic fits" (?) since the age of nine years, and he loses consciousness and has bitten his tongue on several occasions. Patient has globus hystericus, a poor appetite, sleeps pretty well towards morning, but dreams a good deal.

(5) *Hysterical deviations of the eyes.*

I have only seen two such cases of conjugate deviation of the eyes to the left side. The first was shown to me by Dr. Little, and the second was a case of my own. Both were young girls, and the former, I find, was formerly at another hospital for hysterical contraction of the hip.

(6) This, the largest group, consists of cases in which the symptoms are bilateral and equal, and are chiefly and often solely comprised in the term asthenopia, with peripheral contraction of the fields. There may or may not be impairment of central vision, and it is worthy of note that the colour perception and general cutaneous sensibility are unaffected. Most of the patients are young women, but

we have notes of five cases in the male sex. Among the other less important eye symptoms are hyperæmia and suffusion of the eyes with tears, paresis of accommodation, photophobia, and blepharospasm, also after-images, micropsia, and monocular diplopia.

The general symptoms are in these patients extremely numerous, and include loss of sleep, hallucinations of sight, forgetfulness, vomiting, neuralgia, general convulsions and functional paralysis. The neurotic disposition, usually well marked, is often inherited, and the parents are frequently alcoholic or epileptic.

Irregularities of menstruation are certainly common, but by no means invariable. Two patients stated the eye symptoms were worse at their menstrual periods, and in one of these I was able to confirm this on two occasions. In a third case the dimness of sight came on the very day of her first menstruation, and in one young girl there was leucorrhœa. In two cases only was there actual uterine disease, retroflexion in the one, and laceration of the cervix in the other, so that on the whole I do not feel justified in attributing these cases directly to the effects of disorder of this function, but I think it is an important factor.

The eye symptoms often come on gradually, and in some cases, as in 33 and 43, asthenopia and conjunctival injection may be present for a considerable time before amblyopia and contraction of the field appear. I have known recovery to take place in a few weeks, but the symptoms do not usually disappear for many months or even for some years. Case 44 while under observation developed monocular amblyopia and anæsthesia of the same side, and thus became a typical example of Charcot's cases.

Finally, as regards the seat of the vascular or other changes that lie at the root of functional contractions of the field, I am inclined to believe that these are situated in the centres of vision, because the contraction of the field, the colour perception, the diminution of central vision, and

the anæsthesia are so *variously combined*, which could hardly be the case if the changes were purely retinal.

Case 18 (Dr. Little, vol. ii, 217).—Eliz. J—, æt. 16, mill worker.

R. and L. 1 $\frac{6}{6}$. No H. m.*

Fundi normal. Extreme peripheral contraction of fields (charts). Colour perception good.

"Can only see in the centre, and everything looks too small." This came on suddenly when at her work three weeks ago. Menstruation regular, does not sleep well. Hæmic cardiac murmur. Urine 1010°, no albumen. Is a slim pale girl, composed and collected in manner, rather tearful, and she shed tears when we were tracing her fields. In one month she completely recovered in every respect.

Case 19 (Dr. Glascott, vol. ii, 312).—Ann W—, æt. 21, married.

R. and L. $\frac{6}{18}$, when her slight myopia and astigmatism is corrected.

Fundi normal. Charts show peripheral contraction for white, red, and green. Subject to periodical attacks of dimness of sight for two years, and she had an attack when I was taking her field. She has one child, which she is suckling. She has fits in which "she works her hands and legs," is unconscious, and has several times bitten her tongue. Her mother had the same kind of fits before she was married. She cries for very little cause.

Case 20 (Dr. Glascott, vol. ii, 391).—Betsy C—, æt. 43, widow for eight years.

R. $-\cdot5$ Cyl. $=\frac{6}{6}$.

L. $+\cdot75$ Cyl. $=\frac{6}{9}$.

R. pupil smaller than left; fundi normal. Charts show extreme peripheral contraction. No anæsthesia. Complains of L. eye failing for twelve months. Suffers from neuralgia and left-sided sweating.

* Recorded by me in "The Field of Vision," 'Medical Chronicle,' November, 1885.

Case 21 (Dr. Glascott, vol. ii, 421).—Mary T—, æt. 12.

R. and L. $1\frac{6}{6}$. No H. m.

Charts show slight peripheral contraction. Fundi normal. Hysterical ptosis. Complains of numbness of outer side of R. leg, but on testing I could not make out any difference in this respect.

Case 22 (Dr. Little, vol. ii, 452).—Thos. B—, æt, 55, married, fustian cutter.

R. and L. $\frac{6}{12} + \cdot 5$ D. $= \frac{6}{9} + 3 \cdot 5$ D. $= 1$.

Some gluing together of lashes from conjunctivitis. Fundi normal. Charts show extreme peripheral contraction. Sight bad for three months, cannot stand the glare, and he gets a headache. Sight often goes for a short time. Is a very nervous man ; the banging of a door will cause him great alarm and palpitation of heart. In twenty-six months fields are normal and his sight has been improving for last six months.

Case 23 (Dr. Glascott, vol. ii, 495).—Jas. S—, æt. 14, errand boy.

R. and L. 1, with difficulty, and $\frac{6}{12}$.

Fundi normal on dilatation, and no error of refraction. Charts show marked peripheral contraction. Colour perception normal, but is not very sharp at naming colours. Sight failing eighteen months, has been working at the top of sewers, but as this made him ill, he gave it up. In the course of a few weeks his sight became normal.

Case 24 (Dr. Mules, vol. ii, 411).—Hannah T—, æt. 33, married.

R. and L. spells words in 4 J.

Pupils normal. Fundi normal. Extreme peripheral contraction of fields (charts). Sight good up to four days ago, when she fainted at a crowded concert. Six years ago she had a left-sided stroke arm and leg, and her face was pulled to one side. Two years after this she had a similar stroke on the right side, with in addition loss of speech, and was an in-patient at the Royal Infir-

mary. Tendon-reflex seems exaggerated on both sides. She is a nervous and emotional woman, and for last four years has frequently wept causelessly. Heart-sounds are normal. In thirty months the fields are quite normal, and vision seems normal.

Case 25 (Dr. Glascott, vol. iii, 18).—Chas. J—, æt. 43, tailor.

R. and L. $\frac{6}{60}$, not improved by glasses.

Fields extremely contracted (hand test). Colour perception good; no colour scotoma. Fundi normal. Tendon-reflexes exaggerated. Sight going two years. Smokes ½ oz. of tobacco per day, and up till a couple of years ago was a very heavy spirit drinker.

Case 26 (Dr. Hill Griffith, vol. iii, 62).—Eliz. R—, æt. 22, single, servant.

R. and L. 4 slowly, and $\frac{6}{6}$. No H. m. + 3 D., 1 slowly at 8″.

Pupils active. Fields of vision show peripheral contraction. No anæsthesia. Menstruation is regular. Patient is a florid, strong-looking girl. Sight failing three months, and has pain and difficulty in reading. During the last six years she has suffered from several long-continued attacks of vomiting. In four months she completely recovered, the fields became normal, and she could read fine print.

Case 27 (Dr. Little, vol. iii, 63).—Annie S—, æt. 17, mill worker.

R. and L. $\frac{6}{9}$, H. m. ·5 D., and same on dilatation of pupils.

Fields markedly contracted. No anæsthesia. Sight weak and lacrymation for three months.

Case 28 (Dr. Little, vol. iii, 82).—Mary M—, æt. 20, single.

R. and L. $\frac{6}{60}$, not improved.

Fields of vision markedly contracted. Colour perception is bad for blue. No anæsthesia. Sight has been failing

three years; has not been able to follow any employment. Is pale, thin, and has suffered greatly from vomiting up her food. In twelve months I heard from patient that her sight was no better.

Case 29 (Dr. Glascott, vol. iii, 85).—Mary H—, æt. 34, married.

R. + 3 D. = $\frac{6}{12}$.

L. + 3 D. = $\frac{6}{36}$.

Pupils active. Fundi normal. Some hyperæmia of ocular conjunctiva. Fields contracted. No anæsthesia. Colour field normal with R. eye, but feeble with L. eye for all colours, and the lighter shades of blue and green are not recognised with this eye. Sight going two years. Suffered from indigestion. Menstruation is regular. Sexual disinclination. Seen and examined by Dr. Donald, who reported, "Retroversion of uterus, laceration of cervix, with hyperplasia and eversion of lips."

Case 30 (Dr. Glascott, vol. iii, 89).—Eliz. H—, æt. 16, single, servant.

R. and L. 4 at 8″ $\frac{6}{18}$ − 1 D. = $\frac{6}{9}$ 4 at 10″.

Pupils active. Fundi normal. Fields contracted (charts). Colour field normal. Menstruation regular. Sight weak three years. Subject to frontal neuralgia for years.

Case 31 (Dr. Glascott, vol. iii, 91).—Stanley R—, æt. 11, hairdresser.

R. and L. $\frac{6}{18}$, not improved.

Fundi normal. Fields contracted. On atropisation R. $\frac{6}{12}$ almost, L. $\frac{6}{24}$ − 1 D. = $\frac{6}{18}$. Complained of sight for twelve months, especially in L. eye, and he has diplopia with this eye even when the other eye is occluded.

Case 32 (Dr. Glascott, vol. iv, 13).—Adelaide H—, æt. 26, single, servant.

R. and L. 1 at 6″ $\frac{6}{24}$ + 1 D. = $\frac{6}{18}$.

Fundi normal. Charts of fields of vision show peripheral contraction. Colour fields normal. Complained of dizziness and pains in head for over twelve months,

but much worse for last few months. Sometimes she staggers and lets the dishes fall. She nearly fainted and almost fell to the ground when we were examining her as to vision, &c. There is no anæsthesia. Menstruation is regular. No complaint of health. No ovarian tenderness. Quiet and composed in her manner. Rather sleepy appearance.

Case 33 (Dr. Little, vol. iv, 18).—Sophia B—, æt. 15.
R. and L. $\frac{6}{24}$, H. ·5 D.

Fundi normal. Charts of fields show peripheral contraction. Colour field normal. No anæsthesia. Is not emotional or easily frightened or nervous. She complains of a "fog" before the eyes for four months, and I find this came on the very day, as her mother tells me, that she menstruated for first time. Patient was here four years ago. She then complained of her sight, but the vision was normal; there was some injection of conjunctiva.

Case 34 (Dr. Glascott, vol. iv, 91).—Margaret H—, æt. 52, widow.
R. and L. $\frac{6}{18} - 1$ D. $= \frac{6}{12}$.

Pupils active. Fundi normal. Peripheral contraction of fields (charts). Colour field normal. Sight affected for six months.

Case 35 (Dr. Glascott, vol. iv, 108).—Robt. H—, æt. 24, married, tram-guard.
R. and L. $\frac{6}{9} + 1{\cdot}5$ D. $= \frac{6}{6}$ 4 + 4·5 D. = 1 at 6″—12″.

Pupils not wide, and active. Extreme peripheral contraction of fields. Paresis of accommodation. Colour perception good. Fundi normal. "Foamy secretion" on ocular conjunctiva.

Case 36 (Dr. Glascott, vol. iv, 123).—Emily H—, æt. 15, feather cleaner.
R. and L. $\frac{6}{36} - 1$ D. Cyl. $= \frac{6}{24}$.

Fundi normal. Fields contracted (charts), colour perception normal. Pupils active. The sight has been defective

for four months, and she has made mistakes in sorting colours. She noticed her hair came out a good deal about the time, and there are now several bald patches. Menstruation is regular and normal, commenced when thirteen years of age. Is a big girl for her age, and does not seem nervous. Under observation twelve months; vision has varied from $\frac{6}{6}$ at one time to $\frac{6}{12}$, but the fields have remained contracted.

Case 37 (Dr. Mules, vol. iv, 173).—Mary W—, æt. 12 years and 3 months.

R. and L. 1 with difficulty and $\frac{6}{12}$, after dilating.

R. + 1 D. = $\frac{6}{24}$. Fundi normal.

L. + 1 D. = $\frac{6}{18}$. No astigmatism.

Fields (hand test) markedly contracted all round. Colour perception good. Tonsils meet, throat was inflamed one month ago.

Parents are both very drunken people, and the grandmother tells me the child has been often in dread of them.

In nine months V. = $\frac{6}{12}$ as before, but with a blue glass the vision is a full $\frac{6}{9}$; the fields are now normal.

Case 38 (Dr. Glascott, vol. iv, 204).—Mary S—, æt. 38, widow for twelve months.

R. and L. $\frac{6}{12}$ after correction of slight astigmatism.

Fundi were normal. Extreme peripheral contraction of fields. No tobacco, temperate woman, married when twenty. No pregnancy. Menstruation has occurred every fortnight ever since first established, pupils, heart-sounds, tendon-reflex, and locomotion are normal; voice is little more than a whisper, had a bad throat a short time ago.

Her sight has been bad off and on for twelve months, and she cannot find her way about the street it is at times so bad. She is very slow in all her movements and actions.

Case 39 (Dr. Little, vol. iv, 281).—Frances B—, æt. 17 years and 5 months.

R. and L. 4 at 8″ $\frac{6}{36}$ + 1 D. = $\frac{6}{12}$, 1 at good distance but slowly.

Cannot use ophthalmoscope as blepharospasm comes on at once on throwing light into the eye. Fields contracted. Colour perception good. Menstruation regular, but sight is worse at periods.

Sight has been affected since last few months; she is unable to follow any work; everything goes after looking at it a short time.

Case 40 (Dr. Glascott, vol. iv, 65).—Theresa G—, æt. 19, mantle maker, single.

R. and L. 1 $\frac{6}{0}$ + 1 D. = $\frac{6}{18}$.

Fundi normal, charts show peripheral contraction of the fields of vision. Pupils active.

Sight bad nearly twelve months; a shade comes over her eyes, and then she is unable to continue her work.

Case 41 (Dr. Little, vol. iv, 68).—Sarah F—, æt. 17, single, mill-worker.

R. and L. 16 at 4″ + 1·5 D. = $\frac{6}{18}$ almost.

Fundi normal, dilated. H. = 1 D. No astigmatism. Peripheral contraction of fields. Colour perception feeble. No anæsthesia. Sight has been worse for last three years, but even before that it was weak; the sight often goes completely for half an hour at a time, and she cannot face the light; suffers from severe headaches. There is some slight menstrual irregularity, and her mother tells me she suffers from "whites."

In eighteen months the symptoms are unchanged.

Case 42 (Dr. Mules, vol. iv, 78).—Ruth A—, æt. 19, single, mill-worker.

R. and L. 1 and $\frac{6}{6}$ but slowly.

Fundi normal, pupils active, eyes easily get suffused with tears. Extreme peripheral contraction of fields. Colour perception feeble. Smell, taste, and general cutaneous sensibility normal.

Sight weak, especially by gaslight, for two months,

clouds come before the eyes, and she sees stars, &c., floating before her. Menstruation is regular, and there is nothing wrong with her general health, but she is troubled with pimples and blotches on the face. She does not seem hysterical.

In twelve months I find the fields are normal, and her sight has been stronger for the last month.

Case 43 (Dr. Little vol. iv, 238).—Lucy H—, æt. 19, single, servant.

R. and L. 1 $\frac{6}{6}$+1 D.=$\frac{6}{6}$.

Moderate peripheral contraction of fields (charts) ; was here ten months ago for "asthenopia from conjunctival hyperæmia," got some lotion, but her sight gets dim, and her eyes tire easily after reading, and become suffused with tears. She also complained of after-images of objects she has been looking at.

Dr. Donald questioned patient and her mother, and ascertained that menstruation is normal.

Case 44 (Dr. Little, vol. iv, p. 239).—Eliza G—, æt. 23, single, dressmaker.

R. and L. 1 $\frac{6}{6}$. H. m. 1 D.

Fundi normal, blepharospasm. No contraction of fields (hand test). Colour perception normal. She has been wearing + 1·5 D. for near work, but she cannot use her eyes for any time, and she can only read very slowly. She is a pale, delicate-looking girl, uses a stick in walking for disease of the hip.

Dr. Donald found retroflexion of the uterus, and that she had been wearing a pessary for over a year, but the symptoms seem to him largely hysterical. Patient suffers from painful menstruation, is ill seven days, and thinks her sight is much worse at that time.

At the next visit two months after I found the L. eye had only V.=16 Jaeger with left-sided dyschromatopsia, anæsthesia, and dulness of hearing.

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In reply to Mr. Ernest Clarke, Dr. Hill Griffith said it was sometimes difficult to draw a distinction between symptoms which were hysterical and those which were simply feigned. The term "hysterical" with reference to his paper was quite understood by the members present, and he would not try to substitute any other word. In reply to Mr. Jessop, he said he had not tried the method of field-taking described by Wilbrand, nor the "spiral" system as suggested by Priestley Smith.

XV. INTRA-CRANIAL AFFECTIONS.

1. *Sequel to a case of hemianopia.*

By Seymour J. Sharkey, M.D.

In vol. iv of our 'Transactions,' p. 276, I recorded "a case of homonymous hemianopia probably due to a cortical lesion."

The patient was aged 53, and for one year and nine months she had had fits always of the same kind. These ceased but left behind weakness of the right arm and loss of vision towards her right side. The fits commenced with convulsions of the left half of each retina (shown by a sudden display of the colours of the rainbow) extending to the arm, then to the right leg, and finally terminating in loss of consciousness and biting of the tongue. They were followed by partial paralysis of the right arm and by persistent hemianopia. The succession of events seemed to point clearly to a cortical lesion, and suggested as its position the middle of the posterior ascending convolution and the parts behind it, viz. the occipito-angular region.

Some three years later, in December, 1886, I saw this patient, and found that she had got stout and well, all signs of paralysis of limbs having gradually disappeared. Mr. Nettleship was good enough to see to the taking of the fields of vision, and he reported that "the area of blindness is probably exactly what it was, allowing for slight errors in observation on the two occasions."

The result of the disease, then, whatever it was in this case, is a permanent paralysis of the left side of each retina; and this points with probability to the occipito-angular

region having been the original focus. Jacksonian convulsions starting from there would naturally proceed to the arm and then to the leg, and it would be very probable, if the disease had a favourable course, that while the paralysis of arm which was due to implication of the adjacent centres, might recover, permanent paralysis of the left half of the retina might result from the destruction of brain at the original focus of disease.

(*November* 10*th*, 1887.)

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2. *Case of cortical and subcortical disease of the occipito-angular region, producing hemianopia.*

By Seymour J. Sharkey, M.D.

J. L—, æt. 29, hawker, was admitted into St. Thomas's Hospital on December 7th, 1886, under the care of Dr. Ord, to whose kindness I am indebted for permission to give an account of the case to this Society.

There was nothing of importance in his family history. From nine years of age to the time of his death the patient had suffered from epileptic fits, and he had once been in Cane Hill Asylum for Epileptic Insanity. He usually had about one fit a week, and he was then considered to be in ordinary health. From time to time he used to have one or more a day. From his brother's description these appeared to be ordinary epileptic seizures, the patient losing consciousness, biting his tongue, and being generally convulsed. The attacks were ushered in by the right hand being drawn up, and the last sensation he was conscious of was that of an electric current passing through his head.

During the last two or three years he had been troubled with pain in the back of his head, and he had had two rather severe head injuries. The last of these occurred

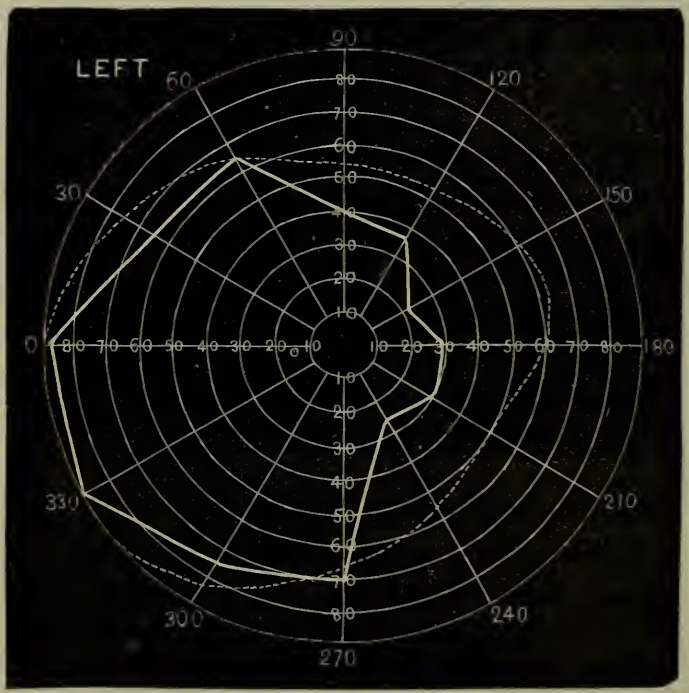
two months before admission to the hospital, when he was struck with a piece of wood on the vertex of the skull. The wound left a scar, and since that time he had been unable to use his right hand, and the right leg was noticed to be weak. The right hand was also said to have been rigid since then, and to have gradually lost sensation.

On December 7th the patient had a fit in the street, and was brought to the hospital. He appeared to be a well-nourished man. His pupils were dilated and unequal, the right being the larger; there were clonic spasms of the muscles of the face, and rigidity of the right arm and leg. He had not bitten his tongue, and he recollected fairly well all that had occurred during the fit. He put his tongue out straight, and it was free from tremor, but there was slight right facial paralysis. The right arm was partially paralysed, so that he could only raise it with difficulty to his head, and the fingers were flexed on the palm. The leg, too, was very weak and somewhat rigid, and the deep reflexes in it were brisk. There was general anæsthesia of face, limbs, and trunk on the right side, and all the special senses seemed to be defective on that side. There was no ocular paralysis, no nystagmus, no colour blindness. Mr. Nettleship's note on December 14th was, "Right disc deep physiological cup, nerve substance decidedly too red; edge of disc hazy but no swelling. In left eye similar appearances but more advanced; there is slight swelling. The condition is one of capillary congestion, with slight œdema of disc, and it is likely, but not certain, to pass into well-marked neuritis." Subsequently this did occur, and hæmorrhages likewise made their appearance.

On December 11th Dr. Hadden noted that on testing him roughly he seemed to have right lateral hemianopia.

On January 7th his fields of vision were very carefully and repeatedly taken, and although his answers were not all that could have been wished, I have Mr. Nettleship's authority for saying that the charts may be taken as

RIGHT
90
60
120
30
150
0
180
330
210
300
240
270


LEFT
90
60
120
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150
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210
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240
270

representing approximately the true state of things. No disease of any organ was detected.

The patient died on February 1st, 1887, having suffered from considerable pain in the head, sleeplessness, and gradually increasing dulness, passing finally into coma. His temperature had usually been normal, but it rose during the last two or three days, and just before death it reached 107·4° F.

On February 1st I made a post-mortem examination, and found the body emaciated, the limbs symmetrical in size and shape; no rigidity, except of the fingers of the right hand, which were flexed on the palm. The right elbow presented a vesicular eruption, which was confined to this part. Apart from recent broncho-pneumonia, which occupied the lower parts of both lungs, no organ was diseased except the brain and spinal cord. The latter presented signs of descending degeneration in the right lateral column, which was smaller and greyer than the left.

The skull was remarkable for the thinness of the bones which composed it, those forming the base being particularly affected. The roofs of the orbits were scarcely thicker than paper, and the petrous portion of the temporal bone was almost as thin. Nevertheless the grooves in which the vessels ran had singularly overhanging edges, amounting in some instances almost to exostoses.

The longitudinal sinus was healthy and contained post-mortem clot, and the other sinuses were in a similar condition. The surface of the brain was very congested, the whole having an evenly pink hue, due to the prominence of the smaller vessels. There was no inflammation of vertex. The membranes at the base were opaque and slightly thickened by inflammation, which was clearly chronic. There was no fluid in the optic sheath or in the ventricles. No tumour was visible on the surface, but the convolutions of the left occipital lobe and of part of the parietal lobe were much thinned, and formed the roof of a cavity which on being incised gave exit to a brownish

fluid. The convolutions thus thinned were those of the anterior half of the occipital lobe, the superior parietal lobule, and the upper extremity of the angular gyrus. The softening did not extend as low as the upper extremity of the fissure of Sylvius, or as far forwards as the posterior ascending convolution, nor did it pass further backwards than the line of the internal perpendicular fissure. On separating the hemispheres one had to cut through a succulent, deep-red mass of new growth, which ran across from the left hemisphere into the caudate nucleus of the right, to which it was strictly confined. It did not reach sufficiently near to the optic chiasma or nerves to press upon them.

On microscopic examination the new growth proved to be a round-celled sarcoma.

On subsequent examination of the left half of the brain after hardening it in alcohol, the subcortical parts of the whole occipital lobe were found to be destroyed by new growth and softening, which extended nearly up to, but did not invade, the posterior half of the internal capsule. The temporo-sphenoidal convolutions were all intact, as were the two ascending convolutions, with the exception of the posterior part of the superior parietal lobule, which was softened near the median aspect of the hemisphere. The occipital lobe was completely hollowed out, and the angular gyrus was affected, but in a lesser degree. On thinking over the case and the symptoms which were present, I examined with great care the extent of the softening and new growth in the anterior direction, and I convinced myself that the internal capsule was in no way affected, but that the softening extended well into the junction of the white matter of the temporo-sphenoidal and occipital lobes. The importance of this will be mentioned presently.

The pathology of ordinary epilepsy is not revealed at post-mortem examinations; the most that we can do is to argue from our knowledge of physiology what the probable cause of the affection may be. However interesting

therefore the question as to how far the conditions lying at the root of epilepsy may predispose to so gross a disease as a central tumour, so few are the data at our disposal that a consideration of this point must be relegated to a future time.

Passing then from the previous history of the patient we come down to the period when he came under treatment for the gross disease which terminated his life. We have to compare the symptoms present during life with the condition of brain found after death. These symptoms were shortly :

1. Partial right hemiplegia.
2. Optic neuritis.
3. Hemianæsthesia.
4. Hemianopia.

As regards the right hemiplegia, I must confess that I am not quite clear as to the mode of its causation. The only part directly concerned in the movement of the right side of the body which appeared to be diseased was the superior parietal lobule, a part of the centre for the leg. The rest of the motor convolutions seemed to be intact, and the motor part of the internal capsule was clearly healthy. The affection of the right leg then is explained, but the only cause which I can suggest for the paralysis of the right arm is that although the disease seemed to stop short of the posterior ascending convolution, which contains some of the arm centres, yet the neighbouring tumour by its pressure gave rise to sufficient disturbance in these centres to cause paralysis.

The optic neuritis was due in this, as it is in so many other cases of cerebral tumour, to inflammation affecting the membranes at the base.

As regards the hemianopia, the symptom which is the main point of interest here, there can be no doubt that it was due to the cortical and subcortical destruction in the occipito-angular region. The experiments of Ferrier go to prove that it requires a very extensive and complete destruction of both occipital and angular regions to pro-

duce a permanent ocular defect; and this case seems to me to afford a good illustration of this point. And notwithstanding that it is necessarily very deficient in accuracy with regard to some very important points, I still think it worth bringing before the members of this Society. The fields of vision can only be taken as approximately true. They show roughly an homonymous hemiopic defect to the right corresponding with the disease in the left hemisphere. There is also some concentric contraction which is very likely dependent on the optic neuritis present. The patient's mental condition precluded the possibility of ascertaining much more than that he had right lateral hemianopia. This is certain, but the details of the charts cannot be relied upon.

The hemianæsthesia is a very interesting point in the case. Experimental and clinical evidence prevent us from attributing it to the disease, however extensive, of the occipital lobe. The destruction did not reach the internal capsule, which in its posterior third contains the sensory fibres for the other side of the body. The tract of fibres which was affected, in addition to those radiating into the occipital lobe, was that which comes from the convolutions of the temporo-sphenoidal lobe. The latter fibres ascend and meet those from the occipital lobe. before entering the posterior part of the internal capsule. Hence, although the internal capsule was not diseased, hemianæsthesia and hemianopia followed, owing to the affection of its component fibres before entering the capsule, viz. the sensory radiations into the temporo-sphenoidal and callosal regions, and the optic radiations of the occipito-angular region.

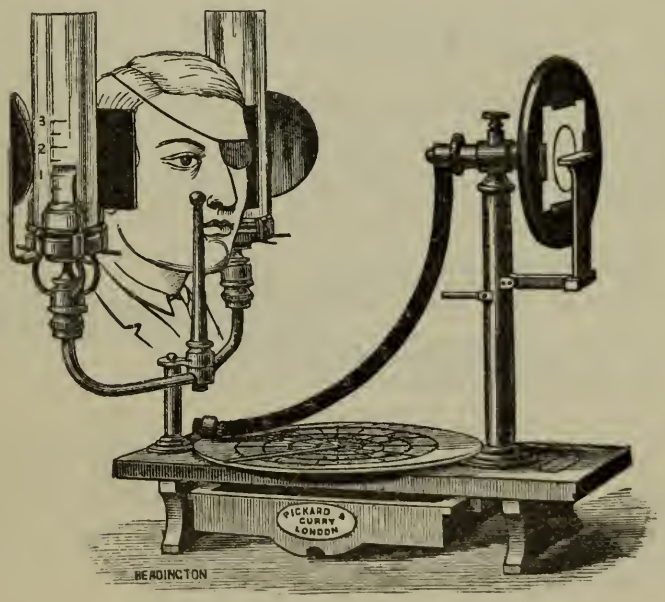
(*November* 10*th*, 1887.)

XVI. INSTRUMENTS.

1. *An arrangement of gas-burners and reflectors for efficient maximum and minimum illumination of the perimeter.*

By Henry Juler.

This can be applied to any form of perimeter. It consists of two Sugg's argand burners one on each side of the patient's head some inches from each temporal region. Behind each burner is placed a large concave



reflector in such a manner as to project the light equally over the whole area of the perimeter without interception by the patient's head.

The examination is made in an otherwise dark room.

The chimneys of the gas-burners are graduated in centimetres so that an approximate estimate of the height of each flame, and consequently of the amount of illumination used at the time of each examination, may be made.

In certain cases, as for example in retinitis pigmentosa, where defective light sense may exist, it is advantageous to be able to obtain uniform *diminution* of illumination; with this apparatus such diminution can be easily obtained and approximately estimated by the comparative height of the flame.

(*Card specimen. November 10th,* 1887.)

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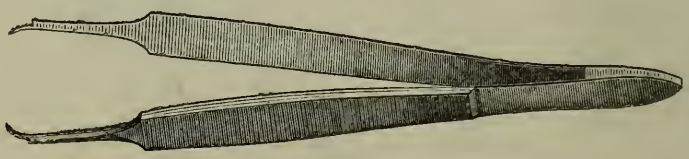
2. *Small fixation forceps, and modified Graefe's knife.*

By Anderson Critchett.

The small forceps are useful for all operations where firm fixation of the globe is required. They are specially valuable when free play for the ring fingers is necessary as



in the method of holding the upper lid during cataract extraction. The fine curved teeth are readily embedded in the subconjunctival tissue, and can be as easily detached.

The modified Graefe's knife bulges immediately below

the point, which is central. The blade is somewhat broader

than is usual, and is made round like that of a Beer's knife in order that the aqueous may not escape too readily.

(*Card specimen. January 26th*, 1888.)

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3. *A simple and safe expedient for enhancing the cosmetic effect of artificial eyes.*

By M. M. McHardy.

I suppose there are very few who have not recognised with regret how a thievish appearance is almost constantly associated with that side of the face on which an artificial eye is worn. Further, that on more than casual observation it is noticeable that the aforesaid thievish appearance associated with the wearing of an artificial eye is more conspicuous when the patient's two eyes are visible than when the artificial eye is alone in view.

Probably most of us have come to attribute this unfortunately associated disfigurement to the insufficient prominence of the artificial eye, and to its insufficient size as compared with the fellow. Now, when a patient has lost one eye it behoves him and us to spare no pains to let the remaining eye enjoy the best possible conditions for easiest and most perfect vision, and therefore in most instances to give a correcting glass for such ametropia as may be present.

It follows, then, that one is commonly called upon to prescribe a glass for the remaining eye of such individuals as are reduced to a condition to require an artificial eye, and herein lies ready to hand an opportunity for concealing or at least greatly minimising, and *safely* minimising, by an optical effect those faults which I have referred to above, and which would, undisguised, so pitiably spoil the patient's facial expression. Of course, unless the

patient require a different lens for distance and near vision, he is indifferent as to the power of the lens which he wears before the artificial eye. Now, by placing before the artificial eye a spectacle lens of somewhat higher power than that before the natural eye the appearance of insufficient prominence and insufficient size of the artificial eye is considerably, if not entirely, removed.

I find that most commonly a difference of 3 D., but something between 2·5 D. and 4 D. of difference in power between the lens in front of the natural and that in front of the artificial eye will produce the desired effect. I mean that if the natural eye requires + 1 D. then I give probably + 4 D., perhaps + 3·5 D. or 4·5 D. to be worn before the artificial eye. So likewise if − 1 D. is required by the natural eye I give + 1·5 D. to 2·5 D. before the artificial eye.

This simple and safe expedient would recommend itself to my mind, and certainly largely to the minds of many wearers of artificial eyes, solely on account of its cosmetic effect, but happily the requisite difference between the two lenses is just about that which is so often found between the lens for distance and that for near vision. Consequently, when from presbyopia or from myopia the natural eye requires to be fitted with separate lenses for the two extremes of vision, I am in the habit of prescribing a reversible frame—either a spectacle frame or a pince-nez,—various patterns of which I have brought down for your inspection, and then, having one side glazed with the distant and the other side with the near vision glass, the coveted optical delusion for cosmetic purposes is obtained while the patient is looking through his distant glass, that is, while he is participating in ordinary social life, and this coveted optical delusion is only effaced when he reverses his glasses in order to follow some such close pursuit as necessarily removes his eyes from general view, and then, in return for the lost cosmetic effect, he enjoys the convenience of having altered his lens without changing, but simply by shifting about, the frame.

As to the novelty of this suggestion I can only express my astonishment if it has not occurred to many, and been put in practice by a few oculists prior to this. However, I have learnt from largely experienced opticians, and notably from a certain one-eyed optician, that never before I prescribed the glasses as now suggested had such an order been given them.

(*May* 3*rd*, 1888.)

Mr. TWEEDY said that doubtless many of those present could bear testimony to the efficacy of the expedient recommended by Mr. McHardy. It was, however, not new. He had himself employed it for many years, and as far as he could trace the origin of its employment in his own practice he owed it to his colleague Mr. Lawson.

XVII. MISCELLANEOUS.

1. *Chronic discharge from (?) frontal sinus dating from August,* 1887, *simulating lacrymal abscess.*

By Poulett Wells.

At the beginning of last June, during the hot weather, when away at the seaside, patient to cool himself put on a cap soaked in water. The next day, and for two or three days following he had a swelling over the left superciliary region and also over the cheek, with deep-seated heavy pain. This passed off, but during the end of August a swelling presented itself at left side of nose high up in the position of the upper half of lacrymal sac. This was opened by a practitioner and subsequently came under my notice as what the practitioner described it. There had never been any epiphora. The canaliculus was slit up, but there was not the least stricture of nasal duct. A probe passed into the sinus could not be made to touch a probe previously placed in the nasal duct. In one spot the probe seemed to encounter a small spicule of bare bone.

On blowing his nose violently he can force out discharge from the sinus ; on one occasion about half a drachm came out in this manner. From the very first, matter has come in this way. There has never been any nasal discharge.

(*Card specimen. January 26th,* 1888.)

REPORT OF THE COUNCIL.

The Council has to announce that the condition of the Society is very satisfactory. During the Session, 15 new members have been added to the list, making a total of 218; this is the largest number the Society has ever mustered; of these 36 are non-resident.

During the last year, two members have been removed by death, viz. Mr. Irwin, of Darlington, and Dr. Samelson, of Manchester.

The fourth Bowman Lecture was delivered by Mr. Henry Power, and Mr. Swanzy, of Dublin, is to give the fifth.

In commemoration of Professor Donders' retirement from the Professorship of Physiology in the University of Utrecht, on the occasion of his attaining his seventieth birthday, a fund was started, the disposal of which for some scientific purpose was to be placed in the hands of Professor Donders. The Society wishing to co-operate, appointed a sub-committee to act in conjunction with the sub-committee of the Physiological Society, and invited subscriptions. The total amount so collected in this country was £289 10s., of which £220 came through the Secretary of the sub-committee appointed by this Society. The number of subscribers was 189 in all. The sum collected in Holland and elsewhere amounted to nearly £3000. With the interest of this, Professor Donders proposes that Scholarships for Physiology and Ophthalmology should be founded in the University of Utrecht. He

expressed his wishes in this respect at the Commemorative Festival held at Utrecht on May 28th, his birthday falling on the previous day, Sunday, May 27th. This was attended by Mr. Jonathan Hutchinson, Dr. Hughlings Jackson, and Mr. Brailey, acting by the wish of the sub-committee as the Delegates of the Society.

The President read a letter from Professor Donders in which he expressed his thanks to the Society for their action in the matter of the Donders Memorial, and his high appreciation of English Science. The President also presented a bronze medal which had been struck in commemoration of the occasion, and sent to the Society by Professor Donders.

The Library continues to increase, and has been more used by members during the past year than had previously been the case. Shortly after the last annual meeting the printing of the catalogue was completed; since that time so large a number of books has been added that it has been found necessary to print a supplement, which is now in the press and will shortly be issued to members. The latter are reminded that printed catalogues can be obtained from the Library attendant, Mr. Poole, for a shilling each.

By the lamented death of Dr. A. Samelson, of Manchester, the Society has lost a most liberal contributor to the Library. The Council gratefully acknowledge the presentation of books from Messrs. Berry, Brudenell Carter, Adams Frost, Nettleship, Swanzy, and the executors of the late Dr. Samelson.

ACCOUNT OF RECEIPTS AND PAYMENTS

OF THE

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Receipts.	£	s.	d.
Balance from 1887	306	1	1
Subscriptions	140	15	4
Composition Fees	26	5	0
Admission Fees	18	18	0
Sir William Bowman, Bart.	50	0	0
Sale of 'Transactions'	25	7	0
Illustrations of Vol. VII	5	5	0
Repaid from Library	1	7	0
	£573	18	5

Payments.	£	s.	d.
Bankers' Charges	0	2	8
Adlard and Son, for printing Vol. VII of 'Transactions,' &c.	140	9	1
Illustrations of Vol. VII	33	4	6
Rent (to March 25th, 1888)	45	5	0
Mr. Poole, for Refreshments, &c.	17	15	0
Secretaries' Expenses	2	16	2
Lamps, &c.	1	17	3
Library	50	0	0
Balance at Bankers	282	8	9
	£573	18	5

WILLIAM M. ORD, *Treasurer.*

Audited and found correct, July 4th, 1888. { A. MONEY, A. QUARRY SILCOCK, } *Auditors.*

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